UT0026
ABQ-033

MINING PLAN DECISION DOCUMENT

Convulsion Canyon Mine
Southern Utah Fuel Company
Sevier County, Utah

U.S. Department of the Interior
Office of Surface Mining Reclamation and Enforcement

Federal Lease U-63214

November 1989

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Federal Lease U-63214
Mining Plan Decision Document

0102M

United States Department of the Interior

OFFICE OF SURFACE MINING
Reclamation and Enforcement
WASHINGTON, D.C. 20240

DEC 18 1989

Memorandum

To: Assistant Secretary--Land and Minerals Management

From: Acting Director

Subject: Recommendation for Approval of the Southern Utah Fuel Company's Convulsion Canyon Mine Mining Plan for Federal Lease U-63214, Sevier County, Utah

I recommend approval of the Convulsion Canyon mine mining plan for Federal lease U-63214 pursuant to the Mineral Leasing Act of 1920, as amended. My recommendation for approval of the mining plan is based on: (1) Southern Utah Fuel Company's complete permit application package (PAP), (2) compliance with the National Environmental Policy Act of 1969, (3) documentation assuring compliance with applicable requirements of other Federal laws, Executive Orders, and regulations, (4) comments and recommendations or concurrence of other Federal agencies and the public, (5) the findings and recommendations of the Bureau of Land Management with respect to the resource recovery and protection plan and other requirements of the Federal lease and the Mineral Leasing Acts, and (6) review of the PAP by the Utah Division of Oil, Gas and Mining as required by the Utah State program and cooperative agreement.

The Secretary may approve a mining plan under 30 U.S.C. 207(c) and 1273(c). Pursuant to 30 CFR Chapter VII, Subchapter D, I find that the proposed mining plan will be in compliance with all applicable laws and regulations. The decision document for the proposed mining plan action is attached.

Attachment

United States Department of the Interior
OFFICE OF SURFACE MINING
RECLAMATION AND ENFORCEMENT
BROOKS TOWERS
1020 15TH STREET
DENVER, COLORADO 80202

In Reply Refer To:

MEMORANDUM

TO: Director

THROUGH: Acting Deputy Director, Operations and Technical Services

FROM: Assistant Director, Western Field Operations

SUBJECT: Recommendation for Approval of the Southern Utah Fuel Company's Convulsion Canyon Mine Mining Plan for Federal Lease U-63214, Sevier County, Utah

I. Recommendation

I recommend approval of the Convulsion Canyon mine mining plan for Federal lease U-63214. This is a new mining plan for an existing underground mine being permitted under the Federal lands program and the approved Utah State program and cooperative agreement. My recommendation is based on the complete permit application package (PAP) submitted by Southern Utah Fuel Company (SUFCO); an environmental assessment jointly prepared by the Office of Surface Mining Reclamation and Enforcement (OSM) and the Utah Division of Oil, Gas and Mining (DOGM); the decision package prepared by Utah DOGM; comments and concurrences of other Federal agencies; and other documentation in the administrative record.

Approval of this mining plan will authorize mining of approximately 86 million tons of Federal coal within 9,905 acres of Federal lease U-63214, as shown on the maps included with this decision document. The review of the PAP indicated that SUFCO's proposal would not require special conditions to be included in the mining plan approval document to comply with Federal law.

Utah DOGM reviewed the PAP under the Utah State program, the Federal lands program (30 CFR Chapter VII, Subchapter D), and the Utah cooperative agreement (30 CFR 944.30). Pursuant to the Utah State program and the cooperative agreement, Utah DOGM is prepared to approve the permit revision application upon approval of the mining plan by the Assistant Secretary.

OSM has consulted with other Federal agencies for compliance with the requirements of applicable Federal laws, and their

comments and concurrences are included in the decision document. The resource recovery and protection plan was reviewed by the Bureau of Land Management (BLM) for compliance with the Mineral Leasing Act of 1920, as amended, and 43 CFR Part 3480, and BLM recommended approval in a letter dated October 27, 1989. The U.S. Fish and Wildlife Service provided its biological opinion under Section 7 of the Endangered Species Act in a letter dated November 9, 1989. The State Historic Preservation Officer concurred with OSM's assessment and recommendations for protection of cultural resources in a letter dated July 18, 1989. The U.S.D.A. Forest Service and BLM, as the Federal land management agencies, concurred with the proposed mining plan action in letters dated October 4, 1989 and September 12, 1989, respectively.

I have determined that the proposed area of mining plan approval is not unsuitable for mining in accordance with section 522(b) of SMCRA.

The permit revision area is located on Federal lands within the boundaries of the Manti-La Sal and Fishlake National Forests. However, based on OSM's analysis and on the concurrence of the USDA Forest Service, the surface operations and impacts of the Convulsion Canyon mine are incident to an underground coal mine and will not be incompatible with significant recreational, timber, economic, or other values of the Manti-La Sal and Fishlake National Forests.

I have determined that approval of this mining plan will not have a significant impact on the quality of the human environment. The impacts of approval of this mining plan and alternatives are described in the environmental assessment included in the decision document.

The mining plan approval document included in the decision document is in conformance with the Mineral Leasing Act of 1920, as amended, and applicable Federal regulations. I recommend that you advise the Assistant Secretary--Land and Minerals Management, under 30 CFR Part 746, that the SUFCO's Convulsion Canyon mine mining plan for Federal lease U-63214 is ready for approval.

II. Background

The Convulsion Canyon underground coal mine is located in Sevier County, Utah, 30 miles east of Salina. The mine has been in operation since 1941. Approximately 68 acres have been affected by the surface disturbance to date. Including the 9,905-acre permit revision area, the total permitted area of the Convulsion Canyon mine will contain about 17,260 acres. Mining is expected to continue for 50 years under Utah permit ACT/041/002 and the approved mining plan.

The Convulsion Canyon mine mining plan was originally approved under the Federal lands program on May 19, 1987. Since that approval there have been no modifications to the Convulsion Canyon mine mining plan. With this action, the Convulsion Canyon mine mining plan area will contain a total of 16,621 acres, including the previously approved mining plan area for Federal leases U-28297, U-062453, U-0149084, SL-062583.

The underground mining operations utilize longwall mining methods. The Lower and Upper Hiawatha coal seams will be mined at an average production rate of approximately 3 million tons per year. No additional surface disturbance other than mining-induced subsidence will result from this action.

A chronology of events related to the processing of the PAP is included in the decision document. The information in the PAP, as well as other information identified in the decision document and made available to the applicant, has been reviewed by Utah DOGM staff in coordination with the OSM Project Leader.

During the review of the PAP, no major issues were identified.

The public was notified of the availability of the PAP for review by publication of newspaper notices for four consecutive weeks ending August 23, 1989. No public comments on the PAP were received after the public notice was published.

Utah DOGM determined that a bond in the amount of $1,172,000 is adequate for the State permit, ACT/041/002, which covers the area of this mining plan action. The bond is payable to the State and OSM.

The PAP submitted by SUFCO and updated through November 1, 1989, Utah DOGM's decision package provided to OSM under the cooperative agreement, the environmental assessment of the proposed action and alternatives jointly prepared by OSM and Utah DOGM, other documents prepared by Utah DOGM, and correspondence developed during the review of the PAP are part of OSM's administrative record.

Raymond J. Lowrie

Raymond L. Lowrie

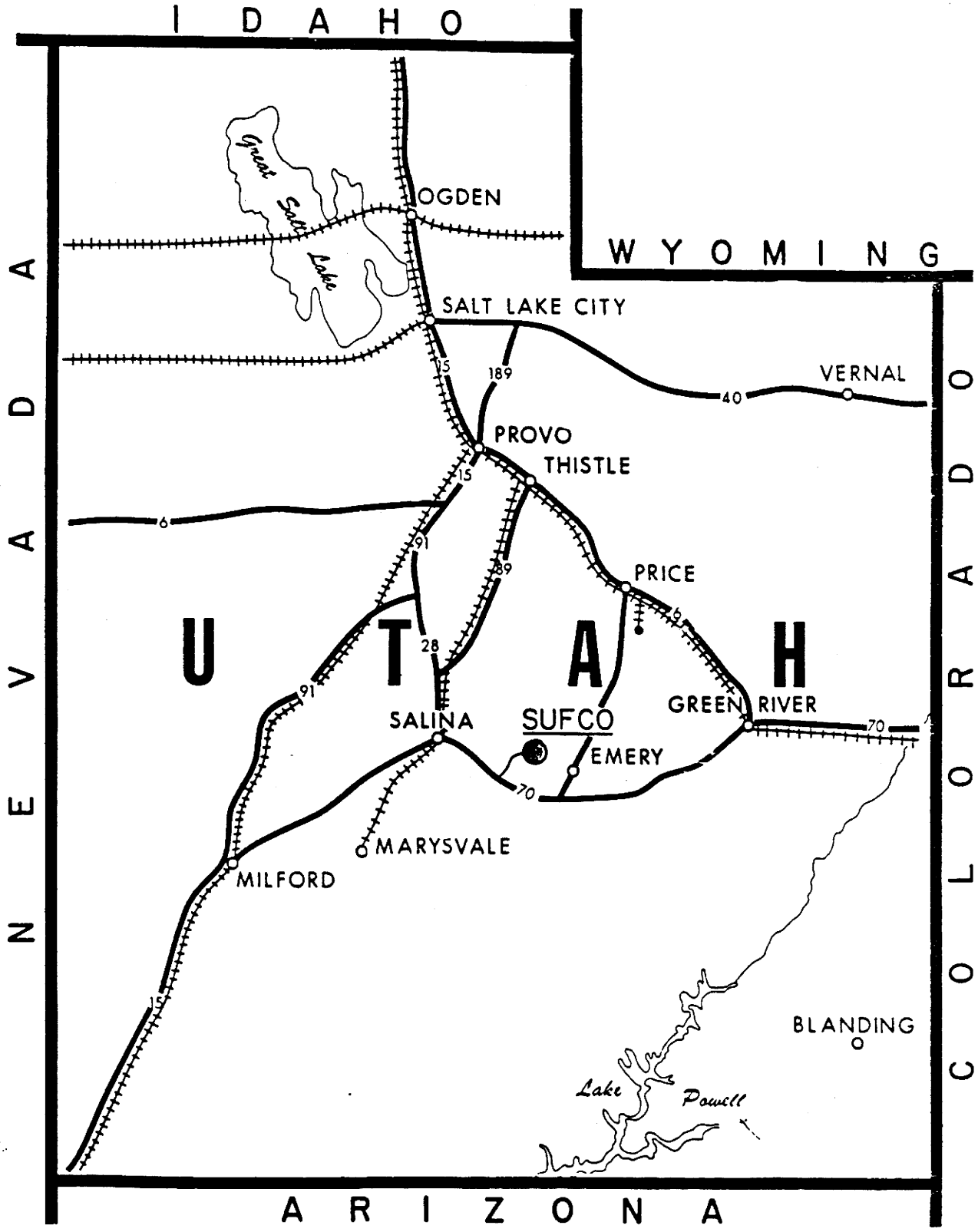
11/17/89

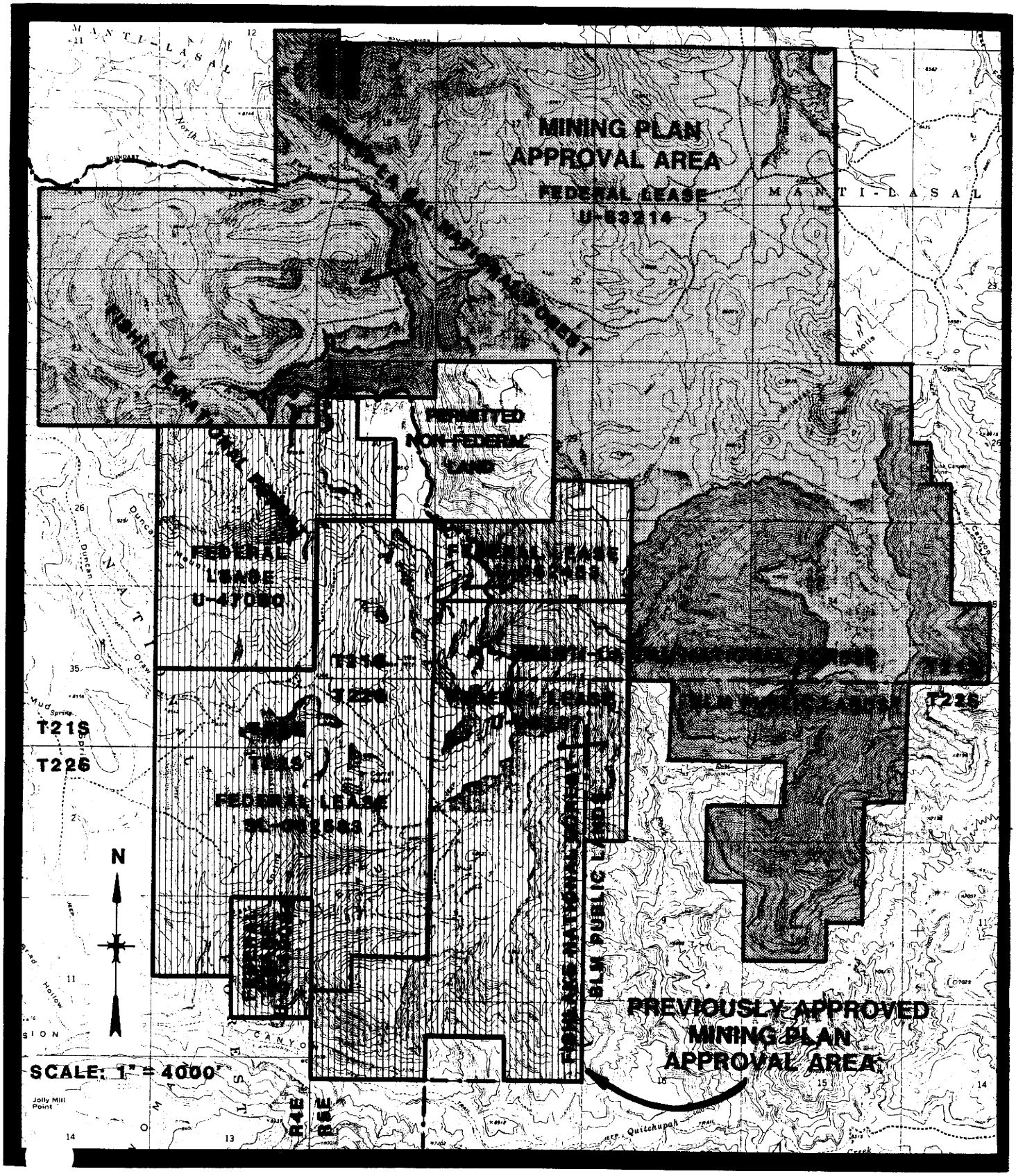
Date

Attachments

GENERAL LOCATION MAP

SUFCO MINE AREA





MINING PLAN APPROVAL AREA MAP
Convulsion Canyon Mine
Sevier County, Utah

CHRONOLOGY

Convulsion Canyon Mine
Federal Lease U-63214
Mining Plan Decision Document

DATE	EVENT
July 3, 1989	Southern Utah Fuel Company (SUFCO) submitted the permit application package (PAP) under the approved Utah State Program to the Utah Division of Oil, Gas and Mining (DOGM) for a permit revision for the Convulsion Canyon mine.
July 10, 1989	The Office of Surface Mining Reclamation and Enforcement (OSM) received the PAP.
July 18, 1989	The State Historic Preservation Office determined that no historic properties would be impacted by the proposed revision.
July 28, 1989	Utah DOGM determined that the PAP was administratively complete for public review and comment.
August 23, 1989	SUFCO published in the Salina Sun and Salt Lake Tribune the fourth consecutive weekly notice that its complete PAP was filed with Utah DOGM.
August 21, 1989	OSM informed Utah DOGM that it had no comments on the PAP.
September 12, 1989	The Bureau of Land Management (BLM) notified Utah DOGM and OSM that it had no concerns with the proposed protection of surface resources administered by BLM.
September 18, 1989	OSM received Utah DOGM's draft Environmental Assessment for review and comment.
September 19, 1989	OSM submitted its comments regarding the draft Environmental Assessment to Utah DOGM.
October 4, 1989	The U.S.D.A. Forest Service provided final concurrence with the approval of the mining plan.
October 27, 1989	BLM provided final concurrence with the approval of the mining plan.

DATE	EVENT
November 1, 1989	OSM received Utah DOGM's final Decision Package.
November 9, 1989	The U.S. Fish and Wildlife Service notified OSM that the 1985 biological opinion for the Convulsion Canyon mine was still valid.

U.S. DEPARTMENT OF THE INTERIOR
OFFICE OF SURFACE MINING RECLAMATION AND ENFORCEMENT
FINDING OF NO SIGNIFICANT IMPACT
for
Convulsion Canyon Mine
Federal Lease U-63214
Mining Plan Decision Document

A. Introduction

Southern Utah Fuel Company submitted a permit application package (PAP) for a permit revision for the Convulsion Canyon mine to the Utah Division of Oil, Gas and Mining (DOGM) under the Utah State program (30 CFR Part 944). The PAP proposes extending underground mining operations into approximately 9,905 acres in Federal lease U-63214 (Quitchupah Lease Tract). The proposed extension would not cause any new surface disturbance other than mining-induced subsidence which could affect surface resources and groundwater.

Under the Mineral Leasing Act of 1920, the Assistant Secretary--Land and Minerals Management must approve, conditionally approve, or disapprove the mining plan for Federal lease U-63214. Pursuant to 30 CFR Part 746, the Office of Surface Mining Reclamation and Enforcement (OSM) recommends approval without conditions.

B. Statement of Environmental Significance of the Proposed Action

The undersigned person has determined that approval of the mining plan would not have a significant impact on the quality of the human environment under section 102(2)(C) of the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4332(2)(C), and therefore, an environmental impact statement is not required. This finding of no significant impact is based on the attached environmental assessment jointly prepared by OSM and Utah DOGM. The environmental assessment has been independently evaluated by OSM and determined to assess the environmental impacts of the proposed action adequately and accurately and to provide sufficient evidence and analysis for this finding of no significant impact. OSM takes full responsibility for the accuracy, scope, and content of the attached environmental assessment. OSM also bases this finding on the following reasons.

C. Reasons

1. Mining-induced subsidence of surface lands within remote plateau areas elsewhere in the Wasatch Plateau Coal Field has not resulted in observable impacts. Accordingly, the lowering of surface lands within the

Quitchupah Lease Tract would most likely not result in adverse impacts.

2. The development of main access entries beneath perennial streams pose low risk for causing adverse impacts to surface water. Mine flooding at the end of mining operations would result in recharging of regional aquifer storage and re-establishment of the natural ground water system that operated prior to mining. The mining plan incorporates mitigation measures to replace water if spring flows are reduced due to mining.

Chief, Federal Programs Division
Western Field Operations

11/17/89
Date

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

QUITCHUPAH LEASE TRACT ADDITION

CONVULSION CANYON MINE
SOUTHERN UTAH FUEL COMPANY
ACT/041/002
SEVIER COUNTY, UTAH

Prepared by

Utah Division of Oil, Gas and Mining

and

United States Department of the Interior
Office of Surface Mining
Reclamation and Enforcement

October 27, 1989

PURPOSE AND NEED

The Utah Division of Oil, Gas and Mining (DOGM) and the Office of Surface Mining Reclamation and Enforcement (OSM) received a Permit Application Package (PAP) for the mining of leased federal coal within the Quitchupah Lease Tract at the Southern Utah Fuel Company's (SUFCO) Convulsion Canyon Mine on July 3, 1989. OSM determined that the proposed operation described in the Quitchupah Lease Tract PAP required approval of a mining plan by the Assistant Secretary - Land and Minerals Management. Pursuant to the Mineral Leasing Act of 1920, as amended, section 523 of the Surface Mining Control and Reclamation Act of 1977 (SMCRA), and 30 CFR 746.14, the Assistant Secretary must approve, approve with conditions, or disapprove the mining plan for the mining of Federal coal as proposed in the PAP. This document assesses the effects of the proposed mining operations within the Quitchupah Lease Tract and alternative actions available to the Assistant Secretary to determine if approval, approval with conditions, or disapproval of the mining plan will have impacts on the human environment. This document supplements the May 1987 Environmental Assessment (EA) for the Convulsion Canyon Mine. Certain portions of this EA summarize detailed discussions from the May 1987 EA where either the descriptions of the Affected Environment or discussion of Impact Analysis have not changed.

The Convulsion Canyon underground coal mine is located in Sevier County, Utah, approximately 30 miles east of Salina, Utah. The mine has been in operation since 1941. The Quitchupah Lease Tract contains 9,905 acres of leased Federal coal within Federal Lease U-63214. No new surface disturbance is proposed. Coal within the Quitchupah Lease Tract will be accessed from existing underground entries in the Convulsion Canyon Mine. Approximately 86 million tons of coal will be mined from this lease tract during the 30 years following permit approval.

Coal is shipped by truck from the mine to Salina or Levan, Utah, where it is further shipped to buyers by truck or rail. Employment at the mine (300 jobs) and in support services (900 jobs) remains at a total of approximately 1,200 persons.

ALTERNATIVES

Alternative 1. Approval Without Special Federal Conditions

The Assistant Secretary-Land and Minerals Management may approve the mining plan in accordance with the recommendation of DOGM. This is the preferred alternative.

Alternative 2, Disapproval

The Assistant Secretary-Land and Minerals Management may disapprove the mining plan which would have the same effect as taking no action.

Alternative 3, Approval With Special Federal Conditions

The Assistant Secretary-Land and Minerals Management may approve the mining plan with special Federal conditions in addition to those attached to Utah Permit ACT/041/002 by DOGM.

The analysis of Alternative 1, Approval Without Special Federal Conditions, did not result in the identification of any impacts that could or should be mitigated beyond that mitigation proposed in the PAP and by Utah DOGM's conditions of approval. Therefore, this alternative is not analyzed further.

AFFECTED ENVIRONMENT

Topography and Geology

The proposed permit area is in the Wasatch Plateau Coal Field, which underlies a major portion of the Wasatch Plateau in Utah. The topography consists of gently rolling surface on the Wasatch Plateau and steep V-shaped canyons with horizontal sandstone ledges at elevations from approximately 6,900 to 9,100 feet.

The major geologic formations of the area are the Blackhawk, Price River, and North Horn Formations. The strata which outcrops within and adjacent to the proposed permit area consists of alternating clays, shales, and sandstones which range from upper Cretaceous to Tertiary in age. The Blackhawk Formation is the coal bearing formation with three coal bearing seams present within the lower 200 feet of this formation: (1) the Upper Hiawatha seam, (2) the Lower Hiawatha seam, and (3) the Duncan seam. The Upper Hiawatha seam and portions of the Lower Hiawatha seam are the economically extractable targets within the proposed permit area. The overburden above the Upper Hiawatha seam in the permit area ranges from 0 feet at the coal outcrop to approximately 1,500 feet near Little Drum Mountain.

Climate and Air Quality

The climate of the proposed permit area is typical of canyon areas of central Utah. Summer temperatures range from 40 degrees to 95 degrees (^{O}F) and winter temperatures average 25 degrees. The average annual precipitation is 12 inches. Winds in the mine area are affected by the area's topography, although general wind directions in the region are from the north-northeast in the winter and south-southwest in the summer.

Central Utah is primarily rural with some light or dispersed industrial activity. Existing air quality is generally excellent, although high total suspended particulate values result from travel on unpaved roads. Carbon monoxide, ozone, lead, and hydrocarbons are not monitored in the region, but are estimated to be within the National Ambient Air Quality Standards (NAAQS) (Bureau of Land Management, 1983).

Surface Water

Surface waters within the proposed Quitchupah Lease Tract permit area drain into the North Fork of Quitchupah Creek, the South Fork of Quitchupah Creek, Dry Fork, Link Canyon, and Box Canyon. All surface water eventually flows to Muddy Creek; a tributary to the Dirty Devil River and hence, to the Colorado River.

The North Fork of Quitchupah Creek, the South Fork of Quitchupah Creek, and Box Canyon are considered perennial. All other drainages are intermittent. Water quality data indicate streams within the proposed permit area are within Utah Water Quality Standards.

Nine stock ponds that intercept surface runoff are located within the proposed permit area.

Mine inflow that is encountered in the Quitchupah Lease Tract would be conveyed to the previously approved discharge location at the Convulsion Canyon Mine. Discharge would be to the main channel of Quitchupah Creek. To date, mine water discharge has met Utah Water Quality Standards.

Subsidence buffer zones, based on a 21 degree angle of draw, would be established to protect the three perennial streams. Only main entry accesses would be developed beneath the streams within the buffer zones. Pillars would be sized to achieve a safety factor of 2.0 to maintain channel integrity.

Ground Water

The U.S. Geological Survey has identified ten springs occurring within the proposed Quitchupah Lease Tract permit area. Five springs occur in the Castlegate Sandstone and five springs occur in the Price River Formation. All springs are considered to have high resource value due to the general dry nature of the proposed permit area.

The Castlegate Sandstone and Price River Formation are extensively exposed within the proposed permit area and are most likely recharged locally from precipitation. Recharge to the Star Point Sandstone and Blackhawk Formation is presumed to occur along naturally occurring faults and fractures. Ground-water flow is assumed to follow the northwesterly dip of the rocks.

Soils

The soils found in the proposed permit area were formed from weathering of clay, sandstone, and limestone. Four soil orders were found to exist in the area. They are alfisols, entisols, inceptisols, and mollisols. Alfisols were formed on side slopes ranging from 15 to 35 percent. Predominant vegetation consists of Douglas fir, spruce, black sagebrush, and wildrye. Entisols and inceptisols were formed on steep slopes of 60 percent or greater. Predominant vegetation is pinyon-juniper, black sagebrush, grasses, and mountain mahogany. Mollisols are found on lesser slopes ranging from 0-15 percent. Typical vegetation is ponderosa, aspen, mountain mahogany, rabbitbrush, and pinyon-juniper (see Volume 5, pp. 13-35, Map B, PAP).

The pH and EC of the soil range from approximately 5.3 to 8.6 and 0.24 to 9.6 millimhos, respectively. Soil textures are from sandy loam to clay. The A horizon ranges from as little as two inches thick in the alfisols, entisols, and inceptisols, to as deep as 12 inches thick in the mollisols (see Volume 5, table 37-59, PAP).

Vegetation

Vegetation types contained within the proposed permit area and adjacent areas include the pinyon-juniper, ponderosa pine, fir and aspen types of the boreal forest biome, and the sagebrush/grass, black sagebrush, and mountain sagebrush types of the desert shrub biome.

No plant species federally listed as Threatened or Endangered (T&E) have been found to occur on the proposed permit area, nor has a literature survey indicated the potential for any such occurrences (letter from Field Supervisor, Endangered Species Office, U.S. Fish and Wildlife Service, May 15, 1985; Environmental Assessment for Coastal States Energy Company, Coal Lease Application U-63214, Quitchupah Tract, October, 1988).

Fish and Wildlife

The proposed permit area consists of a variety of habitat types and, therefore, supports a wide variety of wildlife species. Economically important and high interest species include elk, mule deer, black bear, coyote, mountain lion, mountain cottontail, and several furbearing species. Bird species of high interest that are present in the area include the golden eagle, blue grouse, ruffed grouse, western bluebird, and Grace's warbler. Golden eagle, prairie falcon, and Cooper's hawk nests have been found in or near the proposed permit area.

No fisheries exist within the proposed permit area.

No species officially designated as T&E have been found to reside in the proposed permit area (letter from Field Supervisor, Endangered Species Office, U.S. Fish and Wildlife Service, May 15, 1985, Environmental Assessment for Coastal States Energy Company, Coal Lease Application U-63214, Quitchupah Tract, October 1988). Bald eagles may pass through the area during their annual migration, but none nest or winter in the proposed permit area.

Golden eagles have historically nested within the proposed permit area along the Castlegate Sandstone escarpment. However, mine development plans indicate a subsidence buffer zone will be established outside the escarpment to maintain escarpment integrity. Pillars will be sized to achieve a safety factor of 2.0 to prevent escarpment failure.

Land Use

Land uses in the proposed permit area include mining, logging, livestock grazing, wildlife habitat, watershed, oil and gas exploration, and recreation. Most of these uses have existed since the early 1900's and would be expected to continue without disruption by continued mining in the Quitchupah Lease Tract.

Cultural Resources

More than 10 percent (960 acres) of the proposed Quitchupah Lease Tract permit area has been surveyed for cultural resources. Survey results indicate the area was used lightly in prehistoric times. The U.S. Forest Service concluded in 1988 (letter from Forest Supervisor, Six State Historic Preservation Offices, September 9, 1988; Environmental Assessment for Coastal States Energy Company, Coal Lease Application U-63214, Quitchupah Tract, October 1988) that cultural resource concerns would probably be generally minimal in complexity and that mitigation in the event of future surface-disturbing projects would also be somewhat minimal in difficulty.

Transportation

There are three roads that are used in connection with the surface facilities: Mine Access Road, East Side Road, and the Old Woman Plateau Road. The main Mine Access Road is a paved Sevier County Road (Class B) which extends from Interstate Highway 70 to the guardhouse at the minesite. SUFCO is responsible for the maintenance of the stretch of road in the proposed permit area, 350 feet from the guardhouse north to the surface facilities area. The County Access Road would be left at the conclusion of mining.

Three unimproved access roads occur within the proposed permit area. If roads are impacted by mining-induced subsidence, they would be restored by SUFCO.

Socioeconomics

Currently, SUFCO employs 300 personnel at the mine. Current production (2 MTY) and employment is projected to remain relatively stable through the next five years, but is dependent on market conditions.

According to the company, the following list represents the residential status of employees:

Location	1980 Census Population	Number Employees	Percent
Sevier County			
Salina	3,615	80	27
Richfield	8,062	45	15
Aurora	874	39	13
Redmond	619	23	8
Sanpete County			
Gunnison	2,431	36	12
Other (rural Sevier and Sanpete County)		77	25
Total		300	100

IMPACT ANALYSIS

IMPACTS OF ALTERNATIVE 1, APPROVAL WITHOUT SPECIAL FEDERAL CONDITIONS.

Mining operations within the Quitchupah Lease Tract would not encompass additional surface disturbance. Thus, only mining-induced subsidence would potentially impact surface resources. In areas of double-seam longwall mining (approximately 805 acres), surface lands may be lowered by as much as 12 feet. In areas of single seam mining, surface lands will be lowered proportionately less. Approximately 1,403 acres would be first mined only and 5,757 acres developed as single-seam longwall panels for a total of 7,160 acres of single-seam mining only in the Upper Hiawatha seam.

Mining-induced lowering of surface lands within remote plateau areas elsewhere in the Wasatch Plateau Coal Field has not resulted in observable impacts. Accordingly, the lowering of surface lands within the Quitchupah Lease Tract would most likely not result in adverse impacts.

Surface Water

Mining operations within the Quitchupah Lease Tract would not encompass additional surface disturbance. Thus, only mining beneath perennial streams would potentially impact surface water.

Mining development plans incorporate adequately designed buffer zones for areas beneath perennial streams to maintain channel integrity. Accordingly, the development of main access entries beneath perennial streams pose low risk for causing adverse impacts to surface water.

Ground Water

Mining operations within the Quitchupah Lease Tract may result in the extension and expansion of the existing fracture system and upward propagation of new fractures. Inasmuch as vertical and lateral migration of ground water appears to be partially controlled by fracture conduits, readjustment or realignment in the conduit system would inevitably produce changes in the configuration of ground-water flow. Potential changes include increased flow rates along fractures that have "opened", and diverting flow along new fractures or within permeable lithologies. Subsurface flow diversion may cause the depletion of water in certain localized aquifers and potential loss of flow to springs that would be undermined. Increased flow rates along fractures would reduce ground-water residence time and potentially improve water quality.

Overburden thickness averages 1,000 feet within the Quitchupah Lease Tract and therefore, diversion of spring flow is considered to be at an overall low risk. The mining plan incorporates proposals to replace water if spring flow is reduced due to mining-induced subsidence.

Following cessation of operations, the lower parts of the mine workings would become flooded. Since the northwest portion of the Quitchupah Lease Tract is approximately 500 feet lower than the portals, the potential for complete mine flooding is low because the hydraulic head generated as flooding proceeds would increase until the hydraulic properties of the roof, floor and rib are exceeded, and flow within the rocks initiates. Thus, mine flooding would result in recharging of regional aquifer storage and re-establishment of the natural ground-water system that operated prior to mining. The potential for postmining portal discharge is considered low.

Based on information presented in the PAP, mining within the Quitchupah Lease Tract should not have an adverse impact on ground-water resources.

Soils

No further surface disturbance is associated with the Quitchupah Lease Tract.

Previous analyses of soil materials indicated no acid- or toxic-forming materials are present within the surface disturbed areas of the Convulsion Canyon Mine (Environmental Assessment, Convulsion Canyon Mine, Souther Utah Fuel Company, May 1987).

Vegetation

No further surface disturbance is associated with the Quitchupah Lease Tract.

Past mining activities at the Convulsion Canyon Mine surface facilities have altered and/or removed 17 acres of native vegetation. The life-of-mine operations will not cause long-term adverse impacts because (1) adequate revegetation with native species is practical as proposed, (2) all of the mine-related disturbance has occurred, and (3) all disturbed areas will be revegetated.

Fish and Wildlife

Mining operations within the Quitchupah Lease Tract would not encompass additional surface disturbance.

Mining development plans incorporate adequately designed subsidence buffer zones for areas outside the Castlegate Sandstone escarpment to maintain cliff integrity and thereby, prevent adverse impacts to raptor nesting habitat. Accordingly, mining within the Quitchupah Lease Tract should not have an adverse impact on raptors.

Cultural Resources

Mining operations within the Quitchupah Lease Tract would not encompass additional surface disturbance. Cultural resource surveys indicate the proposed permit area was lightly used by prehistoric people.

The U.S. Forest Service and State Historic Preservation Officer have determined that mining-induced subsidence will have minimal impact on cultural resources.

Socioeconomics

The major project related impact cited by local officials is SUFCO's transportation of coal through the town of Salina. Coal is currently being hauled from the site by 26 to 40 ton capacity trucks at an average rate of 11 per hour, running 20 hours a day, six days a week. The coal is hauled to rail facilities in Salina and Levan, Utah (80 miles one way) or directly to consumers. As a result, there has been a continual need to maintain the road network in the area. Local officials are attempting to facilitate plans for a rail line in the valley to minimize truck haulage of coal.

No adverse impacts are anticipated due to the continued operation of the Convulsion Canyon Mine. Transportation impacts are the major concern to local officials. At present, the mine is a major employer in the area and helps provide stability to the local and regional economy. Cumulative forecasts, however, indicate that some communities will have to further prepare for growth as a result of future energy development projects.

Long-Term Impacts

Long-term impacts that would occur are expected to be minor and include possible subsidence on some parts of the permit area and possible loss of spring flow in the area.

IMPACTS OF ALTERNATIVE 2, DISAPPROVAL

If the Quitchupah Lease Tract mining plan is disapproved, the impacts described for Alternative 1, Approval Without Special Federal Conditions, would not occur. If the mining plan is disapproved, SUFCO would not be able to mine this Federal coal. This would curtail the amount of coal that the company would be able to produce and may result in mine closure at an earlier date when existing permitted coal resources are depleted. One of the most noticeable impacts of mine closure would be a permanent loss of 300 direct and induced secondary jobs in the surrounding region. Local payrolls, retail purchases, and tax collections would also decline. In the long term, closure could result in a decline in local population. The largest share of the losses would be concentrated in Sevier and Sanpete Counties.

Further, this alternative would result in approximately 86 million tons of coal not being mined. However, this alternative would avoid additional subsidence in unmined areas and continued impacts to water, air and land resources. SUFCO would have the option of resubmitting another mining plan for this lease in the future.

PREVIOUS ENVIRONMENTAL IMPACT STATEMENTS AND ENVIRONMENTAL ASSESSMENTS

Environmental studies on the Convulsion Canyon Mine and Quitchupah Lease Tract prepared by Federal agencies include the following documents:

Bureau of Land Management, 1983, "Uinta-Southeastern Utah Coal Region, Final Environmental Impact Statement."

Office of Surface Mining Reclamation and Enforcement, 1987, "Environmental Assessment, Convulsion Canyon Mine, Southern Utah Fuel Company."

U.S. Forest Service and Bureau of Land Management, 1988, "Environmental Assessment for Coastal States Energy Company, Coal Lease Application U-63214 Quitchupah Tract."

CONSULTATION

State Historic Preservation Officer
U.S. Forest Service
U.S. Fish and Wildlife Service
Bureau of Land Management
U.S. Geological Survey

PREPARER

Richard V. Smith, Permit Supervisor, Utah Division of Oil, Gas and Mining

REVIEWERS

Richard Holbrook, Senior Project Manager, Office of Surface Mining Reclamation and Enforcement

Floyd McMullen, Project Leader, Office of Surface Mining Reclamation and Enforcement

AT106

NOV 13 1989

United States Department of the Interior

FISH AND WILDLIFE SERVICE
FISH AND WILDLIFE ENHANCEMENT
UTAH-COLORADO FIELD OFFICE
2060 ADMINISTRATION BUILDING
1745 WEST 1700 SOUTH
SALT LAKE CITY, UTAH 84104-5110

TAKE PRIDE IN AMERICA

In Reply Refer To

(FWE)

November 9, 1989

MEMORANDUM

TO: Chief, Federal Lands Branch, Office of Surface Mining, Denver, Colorado

FROM: Acting Field Supervisor, U.S. Fish and Wildlife Enhancement, Salt Lake City, Utah

SUBJECT: SUFCO/Convulsion Canyon Mine-Section 7 Consultation

The Fish and Wildlife Service has examined the information provided by your memorandum of August 21, 1989 requesting a status review of Section 7 Consultation relating to the subject mine and planned operational expansion. Based upon this information, the Service position presented in our memorandum of May 15, 1985 relating to this mining operation is still valid.

Norman H. Bangerter
Governor
Max J. Evans
Director

State of Utah
Division of State History
(Utah State Historical Society)
Department of Community and Economic Development

300 Rio Grande
Salt Lake City, Utah 84101-1182
801-533-5755

July 18, 1989

Mr. Richard V. Smith
Permit Supervisor
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Quitchupah Lease Tract Addition, Permit Application Package, Southern Utah Fuel Company, Convulsion Canyon Mine, ACT/041/002 (89-1), Folder #2, Sevier County, Utah

In Reply Please Refer to Case No. L905

Dear Mr. Smith:

The Utah State Historic Preservation Office received the above referenced report on July 10, 1989. The report states that no cultural resources were located during the survey of this project area. We, therefore, concur with your recommendation that no historic properties will be impacted by the project.

This information is provided on request to assist the Division of Oil, Gas and Mining with its Section 106 responsibilities as specified in 36 CFR 800. If you have questions or need additional assistance, please contact me at (801) 533-7039.

Sincerely,

Janice Reed Campbell

for James L. Dykman
Regulation Assistance Coordinator

JLD:L905/7289V OR/NP

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

3481
U-63214
(U-067)

Moab District
P.O. Box 970
Moab, Utah 84532

SEP 12 1989

RECEIVED
SEP 14 1989
DIVISION OF
OIL, GAS & MINING

Mr. Richard V. Smith
Permit Supervisor
State of Utah
Division of Oil, Gas and Mining
355 West North Temple Street
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Dear Mr. Smith:

We have received and reviewed a copy of Southern Utah Fuel Company's (SUFCo) Quitchupah lease tract addition to the Permit Application Package (PAP). We found no concerns relative to the protection of surface resources on public land under the Bureau's jurisdiction. The application is also in conformance with current land use plans. Within the limits of our authority, the Bureau recommends approval of the addition to the PAP. SUFCo is in the process of submitting a separate document to us containing a complete and detailed resource recovery and protection plan (R2P2) which will be a part of the PAP. When we have reviewed the expected R2P2, a separate response will be directed to the Division.

If you have any questions, please contact Stephen Falk of the San Rafael Resource Area office in Price, Utah at 637-4584.

Sincerely yours,

Kenneth V Rhea

District Manager

ACTING

cc: AM, SRRA
SD, Utah (U-921)
SUFCo

United States Department of Agriculture | Forest Service | Manti-LaSal National Forest | 599 West Price River Dr. Price, Utah 84501

Reply to: 2820

Date: October 4, 1989

Richard V. Smith, Permit Supervisor
Utah Division of Oil, Gas, and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RE: Quitchupah Lease Addition, Lease U-63214, Permit Application Package (PAP), Southern Utah Fuel Company (SUFCO), Convulsion Canyon Mine, ACT/041/002 - Forest Service Review as the Federal Land Management Agency under 30 CFR Subchapter D.

Dear Mr. Smith:

SUFCO's updated materials (received October 2, 1989) satifactorily address our concerns stated in letters to the Division dated September 1 and September 28, 1989. The Manti-LaSal and Fishlake National Forests consent to approval of the PAP for the Quitchupah Addition to the SUFCO Convulsion Canyon Mine.

SUFCO must still commit to collecting complete baseline water quality and quantity data for all water monitoring sites. We accept your assurance, provided in your telephone discussion with Pete Kilbourne on September 27, 1989, that baseline data collection for all water monitoring sites will be required.

Sincerely,

/s/Jeffrey M. Sims
for
GEORGE A. MORRIS
Forest Supervisor
Manti-LaSal National Forest

/s/J.Kent Taylor
J. KENT TAYLOR
Forest Supervisor
Fishlake National Forest

File ACT/041/002

United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Moab District
P.O. Box 970
Moab, Utah 84532

3482
U-63214
SL-062583
(U-067)

OCT 27

Richard V. Smith, Permit Supervisor
State of Utah
Division of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RECEIVED
OCT 30 1989

Dear Mr. Smith:

We have received and reviewed Southern Utah Fuel Company's (SUFCo) Permit Application Package (PAP), Quitchupah Lease Tract Addition, that was forwarded from you to our San Rafael Resource Area office in Price. In addition, we have received directly from the company a resource recovery and protection plan (R2P2) for the SUFCo Mine No. 1 that addresses the mining plans for this new lease. The PAP regarding surface resources managed by BLM was reviewed and concurred with by memo to you dated September 12, 1989. Our review of the R2P2 follows:

The R2P2 meets the requirements of 43 CFR 3482.1(b), as the required items are included in the R2P2 or can be referenced in the original SUFCo Mine R2P2. The mine plan calls for SUFCo to extend the North Main entries of the existing mine onto the new lease and develop main headings to the north and the east. This will separate the tract into three major mining areas. The first or northeast portion of the tract underneath the heart of the plateau will be mined by longwall mining panels running north and south over a 5-square-mile area. Twelve longwall panels are planned in this area, with many of the panels 9,000 feet long and 750 feet wide capable of producing 3 million tons of coal each. Most of the mining for the next 10 years will be concentrated in this area. The panels and barrier pillars are designed for maximum recovery with due regard for protection of access to the southeast portion of the property.

The second area of mining to be developed after Area 1 is the southeast portion of the lease. This includes the south peninsular area of the plateau formed by Quitchupah Creek Canyon on the west and Link Canyon on the east. This area is to be mined by a combination of longwall and continuous miner panels due to the irregular shape of the peninsula. The mining plans call for

first mining only in panels that are under the Castle Gate escarpment. The planned panel layout depicts recovery in areas best estimated as minable, but recognizes the uncertainty of minable coal from the limited data points and uncertain outcrop burn line.

The third mining area is the remaining lands west of North Mains. This area is planned to be mined by longwall mining methods after the year 2010. This is the only area of multiple seam mining. The interburden between the upper Hiawatha seam (where current mining is taking place) and the lower Hiawatha seam is of sufficient thickness (30+ feet) to be considered minable. The lower Hiawatha seam also has sufficient thickness in this area to be considered minable. Rock slopes that will access the lower Hiawatha seam will be driven down from the upper Hiawatha seam near the Main West entries located in Section 19. The mining plan for the two seams superimposes longwall panels, main entries, and barrier pillars. The upper seam will be extracted first. The mining layout conforms to standard industry and engineering standards. Two large zones in the upper Hiawatha seam are addressed as possible coal-want areas (or areas of thin coal) and fault zones. SUFCo's original submittal showed no planned mining in this area. As a result of BLM's concerns with the nonrecovery of this area, SUFCo submitted amended mining plans on October 19, 1989, showing longwall panels projected through the coal-want areas. Should future exploration show no minable coal, SUFCo is required to submit proposed mine changes, along with justification, to the BLM for approval.

The mining plans for all areas were designed using standard industry practices and known technologies with due regard for safety and the surface environment. BLM does have areas of concern. There are some areas planned for first mining to protect escarpments and perennial streams from damage due to the effects of mining-induced subsidence. Many areas with first mining will have recovery rates on the order of 40 percent and below. While we are committed to the established lease terms and conditions, the BLM must assure MER of all minable coal on a lease with due regard to the surface environment. We reserve the right to further evaluate panels that are limited to first mining only where increased recovery can occur with limited impact to the surface environment. There are joint agency and industry studies being done on the issue of subsidence. The mining plans for the Quitchupah tract show that areas to be protected from subsidence damage are not due to be mined until well after the year 2000. These studies may bring new understanding to all concerned and mining plans can be modified to the betterment of all involved.

In summary, the BLM finds the R2P2 for lease U-63214 to be added to the SUFCo Mine PAP complete and technically adequate. The submitted mine plan is in conformance with the Mineral Leasing Act of 1920, as amended, and satisfies the regulations promulgated from the Act. The plan is also in compliance with the lease terms and conditions. The BLM finds the R2P2 will achieve MER for the mine property. We hereby recommend the R2P2 be approved and coal lease U-63214 be included into the SUFCo Mine permit.

If you have any questions, please contact Brent Northrup of my staff or Stephen Falk at the San Rafael Resource Area in Price.

Sincerely yours,

District Manager

cc: SD, Utah (U-921)
SUFCo, Salina
Manti-LaSal NF, Price

UNITED STATES

DEPARTMENT OF THE INTERIOR

This mining plan approval document is issued by the United States of America to:

Southern Utah Fuel Company
P.O. Box P
Salina, Utah 84654

for the Convulsion Canyon mine mining plan for Federal lease U-63214 subject to the following conditions. Southern Utah Fuel Company is hereinafter referred to as the lessee.

1. Statutes and Regulations.--This mining plan approval is issued pursuant to Federal coal lease U-63214; the Mineral Leasing Act of 1920, as amended (30 U.S.C. 181 et seq.); and in the case of acquired lands, the Mineral Leasing Act for Acquired Lands of 1947, as amended (30 U.S.C. 351 et seq.). This mining plan approval is subject to all applicable regulations of the Secretary of the Interior which are now or hereafter in force; and all such regulations are made a part hereof. The lessee shall comply with the provisions of the Water Pollution Control Act (33 U.S.C. 1151 et seq.), the Clean Air Act (42 U.S.C. 7401 et seq.) and other applicable Federal laws.

2. This document approves the Convulsion Canyon mine mining plan for Federal coal lease U-63214 and authorizes coal development or mining operations on Federal lease U-63214 within the area of mining plan approval. This authorization is not valid beyond:

Lease No. U-63214

T.21S., R.4E., SLM, Utah;
Sec. 12: E1/2 SE1/4;
Sec. 13: E1/2 NE1/4, S1/2;
Sec. 14: E1/2 SW1/4, SE1/4;
Sec. 23: E1/2, E1/2 W1/2;
Sec. 24: All;

T.21S., R.5E., SLM, Utah;
Sec. 15: W1/2;
Secs. 16 through 21: All;
Sec. 22: W1/2;
Sec. 26: W1/2 NW1/4 SW1/4, SW1/4 SW1/4;
Sec. 27: All;

T.21S., R.5E., SLM, Utah (cont.);
Sec. 28: N1/2, N1/2 SW1/4, SE1/4 SW1/4, SE1/4;
Sec. 29: E1/2 NE1/4, NE1/4 SE1/4;
Sec. 30: Lot 1, N1/2 NE1/4;
Sec. 33: Lots 2-4, NE1/4, E1/2 NW1/4, NE1/4 SW1/4, N1/2 SE1/4;
Sec. 34: All;
Sec. 35: Lots 1, 2, W1/2 NW1/4, N1/2 SW1/4;

T.22S., R.5E., SLM, Utah;
Sec. 3: Lots 1-4, S1/2 N1/2, NE1/4 SW1/4, S1/2 SW1/4, N1/2 SE1/4, SW1/4 SE1/4;
Sec. 4: Lots 1, 2, S1/2 NE1/4, SE1/4 SE1/4;
Sec. 9: NE1/4 NE1/4;
Sec. 10: W1/2 NE1/4, NW1/4, N1/2 SW1/4.

as shown on the map appended hereto as Attachment A.

3. The lessee shall conduct coal development and mining operations only as described in the complete permit application package, approved by the Utah Division of Oil, Gas and Mining, except as otherwise directed in the conditions added to this mining plan approval.

4. The lessee shall comply with the terms and conditions of the leases, this mining plan approval, and the requirements of the Utah Permit number ACT/041/002 issued under the Utah State program, approved pursuant to the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.).

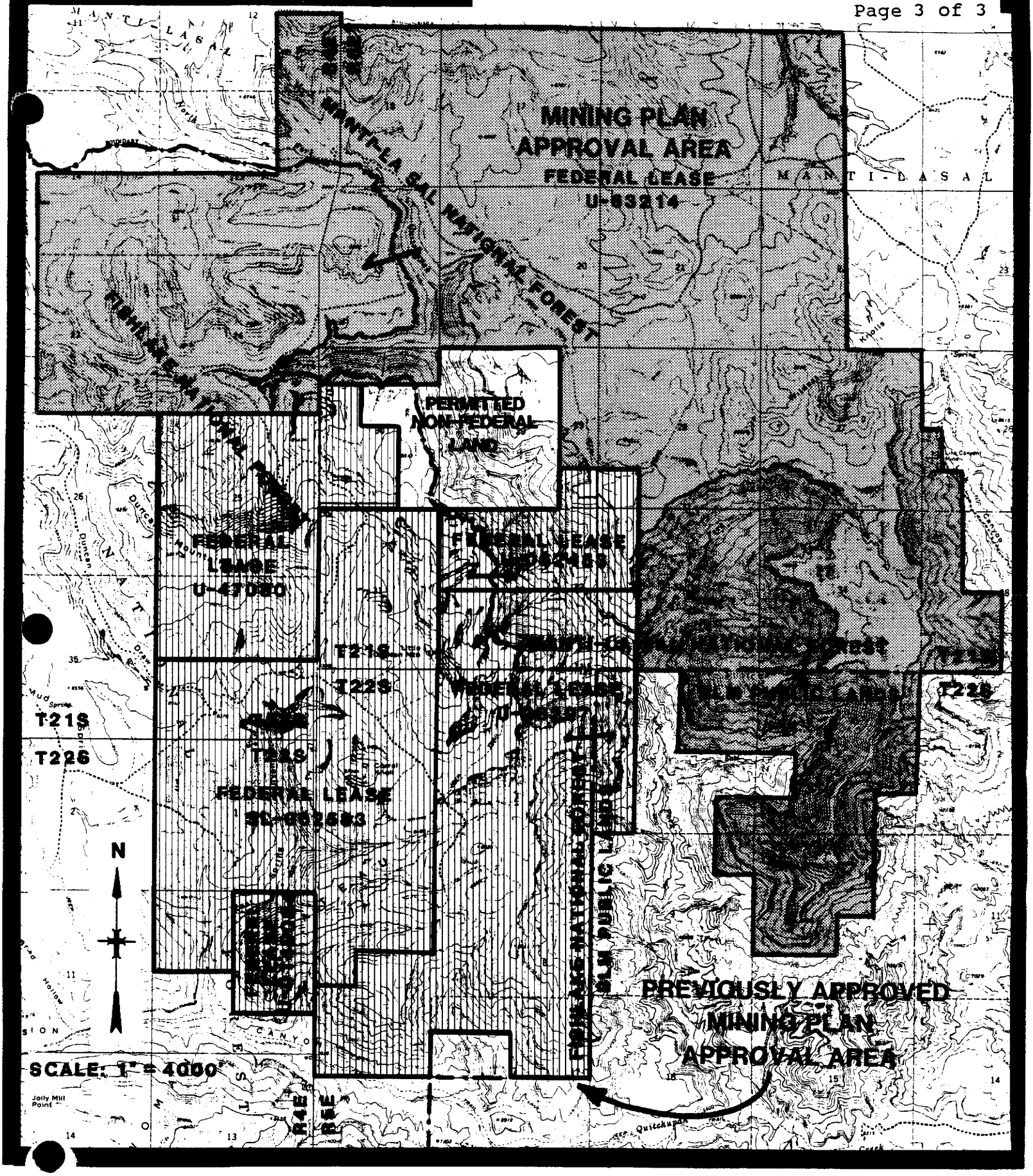
5. This mining plan approval shall be binding on any person conducting coal development or mining operations under the approved mining plan and shall remain in effect until superseded, cancelled, or withdrawn.

6. If during mining operations unidentified prehistoric or historic resources are discovered, the lessee shall ensure that the resources are not disturbed and shall notify Utah Division of Oil, Gas and Mining and OSM. The lessee shall take such actions as are required by Utah Division of Oil, Gas and Mining in coordination with OSM.

Scott Sewell

Deputy Assistant Secretary--Land and Minerals Management

12/19/89
Date



Attachment A
MINING PLAN APPROVAL AREA MAP
Convulsion Canyon Mine
Sevier County, Utah

ADMINISTRATIVE OVERVIEW
PERMIT
QUITCHUPAH LEASE TRACT ADDITION
CONVULSION CANYON MINE
ACT/041/002

Southern Utah Fuel Company
Sevier County, Utah
October 27, 1989

BACKGROUND

Southern Utah Fuel Company (SUFCO), a subsidiary of Coastal States Energy Company, submitted an application to mine coal in Federal Coal Lease U-63214, which encompasses 9,905.46 acres. This lease is contiguous to, and will be accessed through, the existing Convulsion Canyon Mine. This lease adds 86,000,000 tons of recoverable coal to the mine.

The Convulsion Canyon Mine was in operation prior to enactment of SMCRA and the subsequent Utah Code Annotated (UCA) 40-10-1, et seq. A permanent program permit was issued to the Southern Utah Fuel Company on May 19, 1987. The waste rock disposal site was added to the permitted area on August 26, 1988, and, at that time, Coastal States Energy Company was designated the permittee. SUFCO will continue to act as the operator for the Quitchupah Lease Tract Addition.

The applicant published notice for the Quitchupah Lease Tract Addition permit for four consecutive weeks ending on August 23, 1989. No comments were received.

RECOMMENDATION FOR APPROVAL

Approval of the permit for the Quitchupah Lease Tract Addition is recommended based on a review of the Permit Application Package. The permit will not exceed the original permit term of five years and will expire on May 19, 1992.

CHRONOLOGY
QUITCHUPAH LEASE TRACT ADDITION
CONVULSION CANYON MINE
ACT/041/002

Southern Utah Fuel Company
Sevier County, Utah
October 27, 1989

July 3, 1989	Southern Utah Fuel Company (SUFCO) submits the Quitchupah Lease Tract Addition to the Division.
July 5, 1989	Division submits a copy of the PAP to state and federal agencies.
July 13, 1989	Division sends Initial Completeness Review (ICR) to SUFCO.
July 26, 1989	SUFCO submits ICR responses to the Division.
July 28, 1989	Division issues Determination of Completeness. SUFCO initiates public notice for four consecutive weeks.
Sept. 15, 22 and 27. Oct. 4, 7, 18 and 25, 1989.	SUFCO submits materials addressing technical deficiencies.
October 27, 1989	Division submits the final Technical Analysis and supporting documentation to OSMRE.

AT104/4

MINE PLAN INFORMATION

Mine Name Convulsion Canyon Mine
Quitchupah Lease Tract Add.
State ID: ACT/041/002
Operator Southern Utah Fuel Company
County: Sevier

Controlled By Coastal States Energy Co.

Contact Person(s) Ken Payne
Position: Mine Manager

Telephone: (801) 529-7428

New/Existing New **Mining Method** Longwall

Fed. Lease No.(s) U-63214
Legal Description(s) (see attached)

State Lease No.(s) n/a
Legal Description(s)

Other Leases (identify) n/a

Legal Descriptions

Ownership Data:

Surface Resources (acres)	Existing Permit Area (Convulsion Canyon Mine)	Proposed Permit Area (Quitchupah Lease Tract Addition)	Total Life of Mine Area
Federal	6,716	9,905	16,621
State			
Private	680		680
Other			
TOTAL	7,396	9,905	17,301

Coal Ownership (Acres)

Federal	6,716		16,621
State			
Private	640		640
Other			
TOTAL	7,356		17,261

Mine Plan Information
Waste Rock Disposal Site
Convulsion Canyon Mine

	*Total Reserves	Total Recoverable Reserves
Coal Resource Data		
Federal		
State		
Private		
Other		
TOTAL	172,000,000 tons	86,000,000 tons

Recoverable Reserve Data

	Name	Thickness	Depth
Seam	Upper Hiawatha	13 ft. (ave)	1,300-1,500 ft
Seam	Lower Hiawatha	12 ft. (ave)	1,200-1,270 ft
Seam			
Seam			
Seam			

***Mine Life** 50 years
Average Annual Production 3 million tons **Percent Recovery** 50%
Date Projected Annual Rate Reached 1981
Date Production Began 1941 **Date Production Ends** 2039
Reserves Recoverable by: (1) Surface Mining
(2) Underground Mining longwall
Reserves Lost Through Management Decision unknown
Coal Market unknown

Modifications That Have Been Approved:	**Date**
Waste Rock Disposal Site	8/26/88

The Quitchupah Lease Tract Addition is located 30 miles from Salina,Utah. The permit area includes Federal Coal Lease U-63214 and is described as follows:

Township 21 South, Range 4 East, SLM, Utah

Section 12:	E1/2 SE1/4;
Section 13:	E1/2 NE1/4, S1/2;
Section 14:	E1/2 SW1/4, SE1/4;
Section 23:	E1/2, E1/2 W1/2;
Section 24:	All.

Township 21 South, Range 5 East, SLM, Utah

Section 15:	W1/2;
Sections 16 through 21:	All;
Section 22:	W1/2;
Section 26:	W1/2 NW1/4 SW1/4, SW1/4 SW1/4;
Section 27:	All;
Section 28:	N1/2, N1/2 SW1/4, SE1/4 SW1/4, SE1/4;
Section 29:	E1/2 NE1/4, NE1/4 SE1/4;
Section 30:	Lot 1, N1/2 NE1/4;
Section 33:	Lots 2-4, NE1/4, E1/2 NW1/4, NE1/4 SW1/4, N1/2 SE1/4;
Section 34:	All;
Section 35:	Lots 1, 2, W1/2 NW1/4, N1/2 SW1/4.

Township 22 South, Range 5 East, SLM, Utah

Section 3:	Lots 1-4, S1/2 N1/2, NE1/4 SW1/4, S1/2 SW1/4, N1/2 SE1/4, SW1/4 SE1/4;
Section 4:	Lots 1, 2, S1/2 NE1/4, SE1/4 SE1/4;
Section 9:	NE1/4 NE1/4;
Section 10:	W1/2 NE1/4, NW1/4, N1/2 SW1/4.

Containing 9,905.46 Acres.

FINDINGS

Quitchupah Lease Tract Addition
Convulsion Canyon Mine
ACT/041/002
Southern Utah Fuel Company
Sevier County, Utah

October 27, 1989

1. The plan and the permit application are accurate and complete and all requirements of the Surface Mining Control and Reclamation Act (the "Act") and the approved Utah State Program have been complied with (UMC 786.19[a]).

2. The applicant proposes acceptable practices for the reclamation of disturbed lands (PAP, Part 4). These practices have been shown to be effective in the short-term; there are no long-term reclamation records utilizing native species in the western United States. Nevertheless, the Division has determined that reclamation, as required by the Act, can be feasibly accomplished under the Mining and Reclamation Plan (MRP) (UMC 786.19[b]) (see Technical Analysis [TA] Section UMC 817.111-.117).

3. The assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been made by the Division. The MRP proposed under the application has been designed to prevent damage to the hydrologic balance in the permit area (UMC 786.19[c] and UCA 40-10-11[2][c]). (See Cumulative Hydrologic Impact Analysis [CHIA]).

4. The proposed lands to be included within the waste rock disposal site are:

   a. not included within an area designated unsuitable for underground coal mining operations;

   b. not within an area under study for designated lands unsuitable for underground coal mining operations;

   c. not on any lands subject to the prohibitions or limitations of 30 CFR 761.11[a] (national parks, etc.), 761.11[f] (public buildings, etc.), and 761.11[g] (cemeteries);

d. within 100 feet of a public road; and

e. not within 300 feet of any occupied dwelling (UMC 786.19[d]).

5. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800) (UMC 786.19[e]). (See attached letter from State Historic Preservation Officer [SHPO].)

6. The applicant has the legal right to enter and complete mining and reclamation activities in the permit area through BLM rights of way (UMC 786.19[f]).

7. A 510[c] report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; Southern Utah Fuel Company is not delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with a demonstrated pattern of wilfull violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act (UMC 786.19[g], [h] [i]; [OSMRE Relatedness Report, re-verified October 27, 1989]).

8. Mining and reclamation operations to be performed under the permit will not be inconsistent with other operations anticipated to be performed in areas adjacent to the proposed permit area (UMC 786.19[j]).

9. A detailed analysis of the proposed bond for the Convulsion Canyon Mine has been made. The bond estimate is $1,172,000. The Division has made appropriate adjustments to reflect costs which would be incurred by the state, if it was required to contract the final reclamation activities for the mine site. The Quitchupah Lease Tract Addition will require no more bond. The bond was posted on December 2, 1986, and ridered August 26, 1988, and made payable to OSMRE and the Division of Oil, Gas and Mining (UMC 786.19[k]).

10. The applicant has satisfied the requirements for alluvial valley floors and prime farmlands (UMC 786.19[l]). (See TA Section UMC 785.17 and UMC 785.19).

11. The proposed postmining land use of the permit area has been approved by the Division (UMC 786.19[m]). (See TA Section UMC 817.133.)

12. The Division has made all specific approvals required by the Act, the Cooperative Agreement and the Federal Lands Program (UMC 786.19[n]).

13. The proposed operation will not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats (UMC 786.19[o]). (See TA Section UMC 817.97).

14. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with (UMC 786.11-.15).

15. The applicant proposes to use existing structures in connection with the proposed underground coal mining activities. These structures meet the performance standards of the Act and subchapter K and pose no significant harm to the environment or public health or safety (UMC 786.21) (see TA Section UMC 817.181).

_____
Permit Supervisor

_____
Associate Director, Mining

_____
Director

AT104/8-10

TECHNICAL ANALYSIS
Quitchupah Lease Tract Addition
Convulsion Canyon Mine
ACT/041/002
Southern Utah Fuel Company
Sevier County, Utah

October 27, 1989

UMC 785.17 Prime Farmlands-(RVS)

Existing Environment and Applicant's Proposal

The applicant does not propose to conduct any new surface disturbance within the Quitchupah Lease Tract Addition permit area (page 15). Accordingly, no surface operations will occur within the permit area on prime farmlands historically used for cropland. Therefore, this section is not applicable.

UMC 785.19 Alluvial Valley Floors-(RVS)

Existing Environment and Applicant's Proposal

Quitchupah Creek (R4E, T21S, Section 24, and R5E, T21S, Section 18 and 19) and Box Canyon (T5E, T21S, Section 15) do not traverse alluvial deposits. Moreover, the document entitled "Reconnaissance Maps to Assist in Identifying Alluvial Valley Floors, Central Utah", does not delineate potential alluvial valley floors within or adjacent to the proposed permit area.

Technical staff inspections have not identified the presence of flood irrigation.

Compliance

Sufficient information about alluvial deposits and irrigation is available to determine as required by UMC 785.19(c)(2) that no alluvial valley floors exist.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.11 Signs and Markers-(RVS)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.13-.15 Casing and Sealing of Exposed Underground Openings-(RVS)

Existing Environment and Applicant's Proposal

The applicant drilled five boreholes within the proposed permit area during 1989. Three of the boreholes were completed as groundwater monitoring wells (page 36). Monitoring wells were cased and sealed at the top with a locking cap (Figure 6.1). Upon abandonment, monitoring wells will be plugged with cement (page 19). The two exploration boreholes were plugged following completion (page 19).

No portal development is proposed for the Quitchupah Lease Tract Addition.

Compliance

The applicant has provided adequate plans for temporarily and permanently sealing boreholes. No other exposed underground openings are proposed for the Quitchupah Lease Tract Addition.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.21-.25 Topsoil-(HS)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.41 Hydrologic Balance: General Requirements-(RVS/TM)

Existing Environment and Applicant's Proposal

Surface Water-(TM)

The Quitchupah Lease Tract Addition area is drained by Quitchupah Creek and its tributaries, except for a small section in the northeast corner which is a tributary to Muddy Creek. There are numerous ephemeral tributaries to the main stream system which flow only during periods of precipitation or snowmelt (Volume 10, Chapter 6, page 29).

The applicant states that changes in the gradients of some ephemeral stream drainages will occur due to subsidence and that perennial streams will not be subsided (Volume 10, Chapter 6, page 26).

The applicant states that if the mining operator substantially or permanently alters an existing water right, an alternative water supply will be provided in a manner similar to that outlined in the Convulsion Canyon Mine PAP, page 52.

Ground Water-(RVS)

The applicant provides information about aquifers, springs and mine inflows in Chapter 6 and Exhibit IV. Supplementary information about groundwater is given on Map 6.1 and Map 6.2.

Aquifers. The applicant describes the Castlegate Sandstone and Blackhawk Formation/Star Point Sandstone as the major water-bearing lithostratigraphic units in the permit and adjacent area (page 36). Water level measurements from boreholes within and adjacent to the permit area indicate ground water within the Star Point-Blackhawk aquifer moves towards the southeast (Map 6.2). These data also suggest the Castlegate aquifer is of a more limited extent.

Minor faulting occurs in the northwestern portion of the permit area (Map 5.3) and may influence ground-water movement by intercepting lateral flow and redirecting it downward.

Ground Water Use. Ground water from Castlegate aquifer springs within and adjacent to the permit area is used by wildlife and for stockwatering (page 35).

Springs. Map 6.1 indicates two springs occur adjacent to the permit area. These springs have been designated GW-21 and GW-13 and occur in the Castlegate Sandstone and North Horn Formation, respectively. Total discharge from GW-21 and GW-13 is less than 5 gpm.

Exhibit IV gives water quality data from springs within and adjacent to the permit area. Data indicate the water quality of springs associated with the Castlegate aquifer is better than the water quality of the Star Point-Blackhawk aquifer.

Mine Water. Mine water has been monitored at three locations (Map 6.1). Total mine inflow is approximately 690 gpm of which 40 gpm is lost to mine ventilation and 650 gpm is discharged to the North Fork of Quitchupah Creek.

Exhibit IV gives water quality data for mine inflows and discharge. A comparison of inflow to discharge data indicates some localized water quality degradation occurs as water comes in contact with the workings. However, mine discharge is within state and federal effluent limits as identified in the approved UPDES permit.

Compliance

Surface Water-(TM)

The applicant has provided the necessary information to document that perennial streams will not be subsided within the lease tract (Map 5.4, Subsidence Areas).

There are no surface facilities associated with the Quitchupah Lease Tract Addition, therefore no surface disturbance to cause changes to surface water quality or quantity are expected from the lease addition.

The applicant has provided subsidence buffers for all perennial water sources, as well as developed a comprehensive surface water monitoring program to define existing resources within the lease tract and any potential changes to these resources.

The applicant commits to replacing any existing water right disturbed or disrupted by mining.

The applicant is in compliance with this section.

Ground Water-(RVS)

The applicant provides information about the use, occurrence, and characteristics of ground-water resources within and adjacent to the permit area.

No springs occur above the projected areas of mining or the attendant zone of subsidence.

Mine inflows have been monitored and will be monitored in the future.

Mine water discharge occurs at the North Fork of Quitchupah Creek and is monitored to assure effluent limits are met.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.42 Hydrologic Balance: Water Quality Standards and Effluent Limitations-(RVS)

Existing Environment and Applicant's Proposal

Mine water is typically discharged to the North Fork of Quitchupah Creek. However, it may also be discharged to Convulsion Canyon. Both locations are monitored according to an approved plan and are UPDES discharge points (Annual Hydrologic Monitoring Report for 1988).

Compliance

Prior to discharge, mine water is treated in a sump and monitored according to an approved UPDES permit.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.43-.47 Hydrologic Balance: Diversions, Sediment Control Measures, Sedimentation Ponds, Discharge Structures-(TM)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.48 Hydrologic Balance: Acid-Forming and Toxic-Forming Materials-(HS)

Existing Environment and Applicant's Proposal

All underground development waste produced within the Quitchupah Lease Tract Addition will be disposed of in Southern Utah Fuel Company's waste rock disposal site (Volume 10, page 15).

Quarterly (composite) samples of the waste rock material will be collected from active areas within the waste rock disposal site and analyzed for the acid- and/or toxic-forming potential. All identified acid- and/or toxic-forming materials (ATFM) will be buried within 30 days after the material is first exposed on the mine site (Volume 9, page 28). The applicant has committed to submitting a mitigation plan to the Division for approval within 30 days of receipt of the acid- and/or toxic-forming potential analysis.

A minimum of 45 inches of suitable soil will be redistributed on the waste rock disposal site (see Stipulation Response UMC 817.48, Waste Rock Disposal Site, September, 1988).

The applicant has submitted acid- and/or toxic-forming potential anlayses from the advance drill holes No. 89-18-1 and No. 89-20-2.

Compliance

Data derived from advance drill holes indicate an unacceptable sodium adsorption ratio (SAR) for the floor material extracted from Drill Hole No. 89-20-2 (SAR-25.13).

The Waste Rock Disposal Site Reclamation Plan should be adequate to prevent sodic material from contacting a large portion of the root zone. However, if quarterly sampling and analyses of the material stored in the waste rock disposal site indicate widespread suspect SAR levels and/or unacceptable concentrations of other constituents (including, but not limited to, Selenium, Boron and Electrical Conductivity), then the applicant must derive an adequate mitigation plan.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.49 Hydrologic Balance: Permanent and Temporary Impoundments-(TM)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.50 Hydrologic Balance: Underground Mine Entry and Access Discharges-(RVS)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not incorporate additional surface entries. Accordingly, no new mine water discharge points will occur.

Water intercepted during mining of the Quitchupah Lease Tract Addition will be conveyed through access entries beneath Quitchupah Creek and discharged at approved UPDES point UT 0022918 (page 19).

Rocks within the permit area strike north 40 degrees east and dip 2 degrees northwest, indicating ground water intercepted by mining will naturally flow away from developed surface entries.

Compliance

The applicant has provided plans for discharging water during the operational phase of mining. Mine water discharge will be required to meet UPDES effluent limits.

Following abandonment, mine inflow will naturally accumulate in the northwest portion of the proposed permit area away from surface entries. Moreover, access entries beneath Quitchupah Creek will be sealed to prevent drainage.

The applicant has demonstrated that entries and seals have been and will be constructed to prevent gravity discharges. In addition, discharges will be monitored to assure compliance with effluent limits.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.52 Hydrologic Balance: Surface and Ground-Water Monitoring-(MMD)

Existing Environment and Applicant's Proposal

All surface drainage in the Quitchupah Lease Tract Addition is part of the Quitchupah Creek drainage basin with the exception of the extreme northeast corner of the lease area, which flows into the Muddy Creek basin. The existing monitoring program for the Convulsion Canyon Mine includes the surface drainages in the Quitchupah Creek basin. Data collected as part of this ongoing program are sufficient to partially satisfy baseline data requirements in the Quitchupah drainage portion of the new lease tract. The applicant proposes to monitor two surface water sites (SUFCO-090 and SUFCO-089) and two springs (GW-13 and GW-21) in addition to the existing monitoring program.

The applicant proposes to establish two surface water monitoring sites in the headwaters of Box Canyon, which is a tributary of Muddy Creek. Box Canyon is considered to be perennial in nature and is the only stream in the lease tract which does not flow into Quitchupah Creek. One sample site is located in a small spring-fed pond at the head of the canyon. This site is identified as SUFCO-089 on Map 6.1 and in the text.

The spring-fed pond at the head of Box Canyon is monitored as a surface water station as outlined in Volume 10. The basin has no outlet or visible water source, consequently water depth is measured as a substitute for flow. The Division believes this site is unique in that it represents neither true ground-water or surface water conditions. Therefore, the operator should be aware that data from this site must be statistically correlated to data collected at other sites before it will be accepted as representative of baseline conditions. Stage measurements of the basin are only useful as an approximate flow indication, and data derived from this site is limited in usefulness.

Table 6.4.1-2 on page 48 presents a surface water sampling frequency of three samples per year during May-June, August and October-November.

Three observation wells identified as 89-18-1, 89-20-2, and 89-16-1 are proposed to be monitored triannually according to Table 6.4.1-2 (page 45).

The applicant proposes on page 44 to establish additional in-mine monitoring points as mining proceeds in the new lease. These sites will be located at "significant" reliable flows and included in the annual summary report.

Compliance

The applicant has provided a plan for monitoring surface water, springs, wells, mine inflows and mine discharge. Baseline data were collected during the 1989 field season. An additional suite of baseline data will be collected during the 1990 field season. Thereafter, the applicant will initiate monitoring according to an operational schedule.

The applicant commits to providing the Division with monitoring data within 90 days of the end of each quarter.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.53 Hydrologic Balance: Transfer of Wells-(RVS)

Existing Environment and Applicant's Proposal

The applicant does not propose to transfer wells. Therefore, this section is not applicable.

UMC 817.55 Hydrologic Balance: Discharge of Water into an Underground Mine-(RVS)

Existing Environment and Applicant's Proposal

The applicant does not propose to discharge water into an underground mine. Therefore, this section is not applicable.

UMC 817.56 Hydrologic Balance: Postmining Rehabilitation of Sedimentation Ponds, Diversions, Impoundments, and Treatment Facilities-(RVS)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.57 Hydrologic Balance: Stream Buffer Zones-(TM)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.59 Coal Recovery-(PGL)

Existing Environment and Applicant's Proposal

The applicant will be mining the Quitchupah Lease Tract Addition in conjunction with the existing operation. There are 86 million tons of recoverable coal that will be produced at an anticipated level of 3 to 3.5 million tons per year from the Quitchupah Lease Tract Addition. Both continuous miners and longwall mining methods will be used to extract the coal reserves. The Resource Recovery and Protection Plan (R2P2) was approved by the BLM on October 26, 1989.

Compliance

The applicant will maximize the recovery of the coal resources as shown in the approved R2P2. The Air Quality Approval Order currently limits production to 2.2 million tons.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.61-.68 Use of Explosives-(PGL)

Existing Environment and Applicant's Proposal

The applicant will not conduct surface blasting within the proposed permit area for the Quitchupah Lease Tract Addition (page 17-3). Therefore, this section is not applicable.

UMC 817.71 Disposal of Underground Development Waste and Excess Spoil-(PGL)

Existing Environment and Applicant's Proposal

The applicant proposes to dispose of underground development waste in an approved waste rock disposal site (pages 11 and 15). The approved waste rock disposal site was permitted for a maximum of 10,000 tons per year. No coal processing waste is generated at this mining operation.

Compliance

The applicant's proposal to dispose of the underground development waste in the approved waste rock disposal area meets the requirements of this section. The applicant is committed to the maximum 10,000 tons per year, despite the increased production.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.72.-74 Disposal of Underground Development Waste and Excess Spoil: Valley Fills, Head-of-Hollow Fills, and Durable Rock Fills-(PGL)

Existing Environment and Applicant's Proposal

The applicant does not propose to dispose of underground development waste or excess spoil in valley fills, head-of-hollow fills or durable rock fills. Therefore, this section is not applicable.

UMC 817.81-.88 Coal Processing Waste Banks-(PGL)

Existing Environment and Applicant's Proposal

The applicant does not propose to develop coal processing waste banks. Therefore, this section is not applicable.

UMC 817.89 Disposal of Noncoal Wastes-(PGL)

Existing Environment and Applicant's Proposal

The applicant proposes to haul noncoal waste to the Salina City Landfill as approved under the Convulsion Canyon Mine Permit (page 16).

Compliance

The applicant's proposal for disposing of noncoal waste meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.91-.93 Coal Processing Waste: Dams and Embankments-(PGL)

Existing Environment and Applicant's Proposal

The applicant will not process coal extracted during mining of the Quitchupah Lease Tract Addition at the Convulsion Canyon Mine (page 16). Therefore, this section is not applicable.

UMC 817.95 Air Resources Protection-(RVS)

Existing Environment and Applicant's Proposal

The applicant received an Air Quality Approval Order on March 3, 1981 for a production level of 2.2 million tons.

Compliance

The current Air Quality Approval Order limits coal production to 2.2 million tons.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values-(BAS)

Existing Environment and Applicant's Proposal

No surface facilities, structures, or powerlines are proposed for the Quitchupah Lease Addition (Chapter 3, page 18). Vegetative disturbance is limited to that incurred during exploratory drilling or by subsidence (Chapter 8, page 45). Subsidence impacts are expected to be limited to lowering of plateau topography (Map 5.1).

The applicant has collected historical raptor data for the lease addition. Dr. Clayton M. White, SUFCO consultant, reported on avifauna of the permit area (Convulsion Canyon Mine PAP, Volume 6). Golden eagles have historically nested in Quitchupah Canyon (Sections 20 and 30 of T21S, R5E--refer to Appendix 1, Map 2). The applicant proposes to limit mining beyond escarpments as a precaution against failing nests by subsidence (Chapter 5, page 27). The applicant has further committed to report the presence of threatened or endangered species or their habitats or any bald or golden eagle (Chapter 3, page 19). The Utah Division of Wildlife Resources recommends no further raptor studies unless escarpments are impacted by subsidence, which is not expected to occur (Chapter 9, page 46).

Aquatic wildlife for the Convulsion Canyon Mine permit area has been described by Dr. Robert N. Winget of Brigham Young University (Convulsion Canyon Mine PAP, Volume 6). No fishery exists within the Quitchupah Lease Tract Addition. Quitchupah and Box Canyon Creeks, which are perennial streams, will be protected by buffer zones (Chapter 5, page 28). Buffer zones will be penetrated by access entries only, which will be sealed after abandonment (Chapter 4, page 21).

Map 8.1 delineates vegetation communities occurring within the Quitchupah Lease Tract Addition. Quantitative vegetation measurements of the Convulsion Canyon Mine permit area have been made by Dr. Stanley L. Welsh. Terrestrial wildlife resources have been described by Drs. H. Duane Smith and Clyde L. Pritchett. Their respective reports are contained in the Convulsion Canyon Mine PAP, Volume 5.

Compliance

The applicant's proposal to restrict subsidence impacts to plateaus while protecting escarpments and perennial streams is considered adequate for preventing or minimizing impacts to fish, wildlife, and related environmental values.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.99 Slides and Other Damage-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to notify the Division promptly after a slide occurs which may affect the public, health or safety (page 15).

Compliance

The applicant's commitment to notify the Division after a slide occurs meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.100 Contemporaneous Reclamation-(BAS)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.101 Backfilling and Grading-(PGL)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.103 Backfilling and Grading: Covering Coal and Acid- and Toxic-Forming Materials-(HS)

Existing Environment and Applicant's Proposal

The data for the potential toxicity of roof and floor rock (submitted October 2, 1989) indicated a potential problem with SAR. Therefore, the commitment in the approved waste rock site will be applicable; i.e., all identified potential acid- or toxic-forming materials must be buried or treated within 30 days after the material is first exposed on the mine site.

Compliance

The applicant's plan to handle the acid- and toxic-forming materials in the previously approved waste rock site meets the requirements to handle acid- or toxic-forming materials from the Quitchupah Lease Tract Addition.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.106 Regrading or Stabilizing Rills and Gullies-(PGL)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.111-.117 Revegetation-(BAS)

Existing Environment and Applicant's Proposal

No vegetative disturbance is anticipated beyond that incurred by exploratory drilling (Chapter 8, page 45). Therefore, this section is not applicable.

UMC 817.121-.126 Subsidence Control-(RVS)

Existing Environment and Applicant's Proposal

The Upper Hiawatha coal seam is the primary mining target within the proposed permit area for the Quitchupah Lease Tract Addition (pages 21 and 22, Maps 4.1 and 4.2). Mining of the underlying Lower Hiawatha coal seam will occur following extraction of the Upper Hiawatha coal seam (Map 4.2). The applicant states that coal reserves will be extracted using both continuous miner and longwall mining techniques (page 21). Most coal will be extracted by the longwall method (Map 4.1).

Overburden thickness within the proposed permit area ranges from less than 600 feet to over 1,600 feet, and averages approximately 1,000 feet (Map 5.1). Stratigraphic units overlying the proposed workings include the Blackhawk Formation, Castlegate Sandstone, Price River Formation, and the North Horn Formation (Map 5.3).

The applicant identifies these springs (page 37 and Map 6.1) and three perennial streams (page 42 and Map 6.1) as the major renewable resources within and adjacent to the proposed permit area. In addition, the applicant depicts on Map 2.1 two unimproved roads and nine surface runoff detention ponds as man-made features occurring above the proposed workings.

The applicant estimates maximum vertical movement over areas of double-seam mining to be 12 feet (page 27). Maximum vertical movement above areas of single-seam mining will be proportionately less.

The applicant commits to establishing subsidence buffer zones beneath the North Fork and South Fork of Quitchupah Creek, Box Canyon, and outside the Castlegate Sandstone escarpment (page 27 and Map 5.4). First mining room and pillar methods will be used within the buffer zones. Pillars are sized to achieve a safety factor of 2.0. Only access entries will be driven beneath perennial streams and a 21 degree angle of draw value will be utilized to delineate the stream buffer zones (page 28).

The applicant has provided a plan for subsidence monitoring (pages 27 and 28). Control stations for photogrammetric monitoring are located on Map 5.4. Monitoring will occur once a year and data will be submitted in the Annual Report (page 27).

Compliance

The applicant has provided information about mining methods, overburden thickness, and vertical movement that indicates activities have been planned and will be conducted to prevent subsidence from causing material damage (UMC 817.121).

The applicant has provided the surface owners (Manti-LaSal National Forest and Fishlake National Forest) with notification of mining schedules on Maps 4.1 and 4.2 (UMC 817.122).

The applicant has provided plans (pages 28 and 34) for restoring water losses, man-made features, and surface lands that have been impacted by mining-induced subsidence (UMC 817.124).

The applicant has provided adequate safety factors and development plans to prevent mining-induced material damage to perennial streams within the proposed permit area (UMC 817.126).

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.131 Cessation of Operations: Temporary-(PGL)

Existing Environment and Applicant's Proposal

The applicant commits to notifying the Division in the event there is a cessation of mining for more than 30 days. The information that will be included in the notice is included on page 17 of the PAP.

Compliance

The applicant's commitment meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.132 Cessation of Operations: Permanent-(PGL)

Existing Environment and Applicant's Proposal

The reclamation of the facilities associated with this operation have already been approved (page 13).

Compliance

The applicant will reclaim disturbances associated with this mining operation.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.133 Postmining Land Use-(BAS)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition is public land, administered by the U.S. Forest Service and Bureau of Land Management (Chapter 3, page 18). The Convulsion Canyon Mine PAP, Volume 3, identifies land uses which include livestock grazing, wildlife use, recreation, selective timber harvest, and watershed development. Present land uses will continue unchanged after termination of mining.

Compliance

The applicant's proposal for postmining land use meets the requirements of this section.

The applicant is in compliance with this section.

Stipulations

None.

UMC 817.150-.176 Roads: Class I, II and III-(PGL)

Existing Environment and Applicant's Proposal

The Quitchupah Lease Tract Addition does not encompass additional surface disturbance. Therefore, this section is not applicable.

UMC 817.180 Other Transportation Facilities-(PGL)

Existing Environment and Applicant's Proposal

The applicant does not propose to establish additional transportation facilities in conjunction with the Quitchupah Lease Tract Addition. Therefore, this section is not applicable.

UMC 817.181 Support Facilities and Utility Installations-(PGL)

Existing Environment and Applicant's Proposal

The applicant does not propose to establish additional support facilities and utility installations in conjunction with the Quitchupah Lease Tract Addition. Therefore, this section is not applicable.

QUITCHUPAH AND MUDDY CREEKS CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

CONVULSION CANYON MINE (QUITCHUPAH LEASE TRACT ADDITION) ACT/041/002

Sevier and Sanpete Counties, Utah

October 1989

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Figures

I. INTRODUCTION

The purpose of this report is to provide a Cumulative Hydrologic Impact Assessment (CHIA) for Quitchupah and Muddy Creeks, located in Sevier and Sanpete Counties, Utah. This assessment encompasses the probable cumulative impacts of all anticipated coal mining in the general area on the hydrologic balance and whether the operations proposed under the application have been designed to prevent damage to the hydrologic balance outside the proposed mine plan area. This report complies with legislation passed under Utah Code Annotated 40-10-1 et seq., and the attendant State Program rules under UMC 786.19[c].

Quitchupah and Muddy Creeks occur within the southern end of the Wasatch Plateau Coal Field, approximately 30 miles east of Salina, Utah (Figure 1). The Wasatch Plateau is a north-south trending high plateau which is bounded by Sanpete Valley to the west and Castle Valley to the east. Elevations along the southern portions of the Wasatch Plateau range from approximately 6,500 to over 9,000 feet.

Precipitation varies from 40 inches at higher elevations to less than 10 inches at lower elevations. The area encompassed by the Wasatch Plateau may be classified as semiarid to subhumid.

GEOLOGY

Outcropping rocks of the Wasatch Plateau Coal Field range from Upper Cretaceous to Quarternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) through littoral (Star Point Sandstone) and lagoonal (Blackhawk Formation) to fluvial (Castlegate Sandstone, Price River Formation and North Horn Formation) and lacustrine (Flagstaff Limestone) depositional environments. Oscillating depositional environments within the overall regressive trend are represented by lithologies within the Blackhawk Formation. The major coal-bearing unit within the Wasatch Plateau Coal Field is the Blackhawk Formation.

VEGETATION

Vegetation of the Wasatch Plateau area is classified within the Colorado Plateau floristic division (Cronquist et al., 1972). The area occupies parts of both the Utah Plateaus and the Canyonlands floristic sections. Vegetation communities of the area include sagebrush-grassland, pinyon-juniper, mountain brush, Douglas fir-white fir-blue spruce, and Engelmann spruce-subalpine fir.

In the sagebrush-grassland type, typical overstory consists of big sage, Artemisia tridentata var. vaseyana or black sage (A. nova) with a co-dominant perennial grass understory.

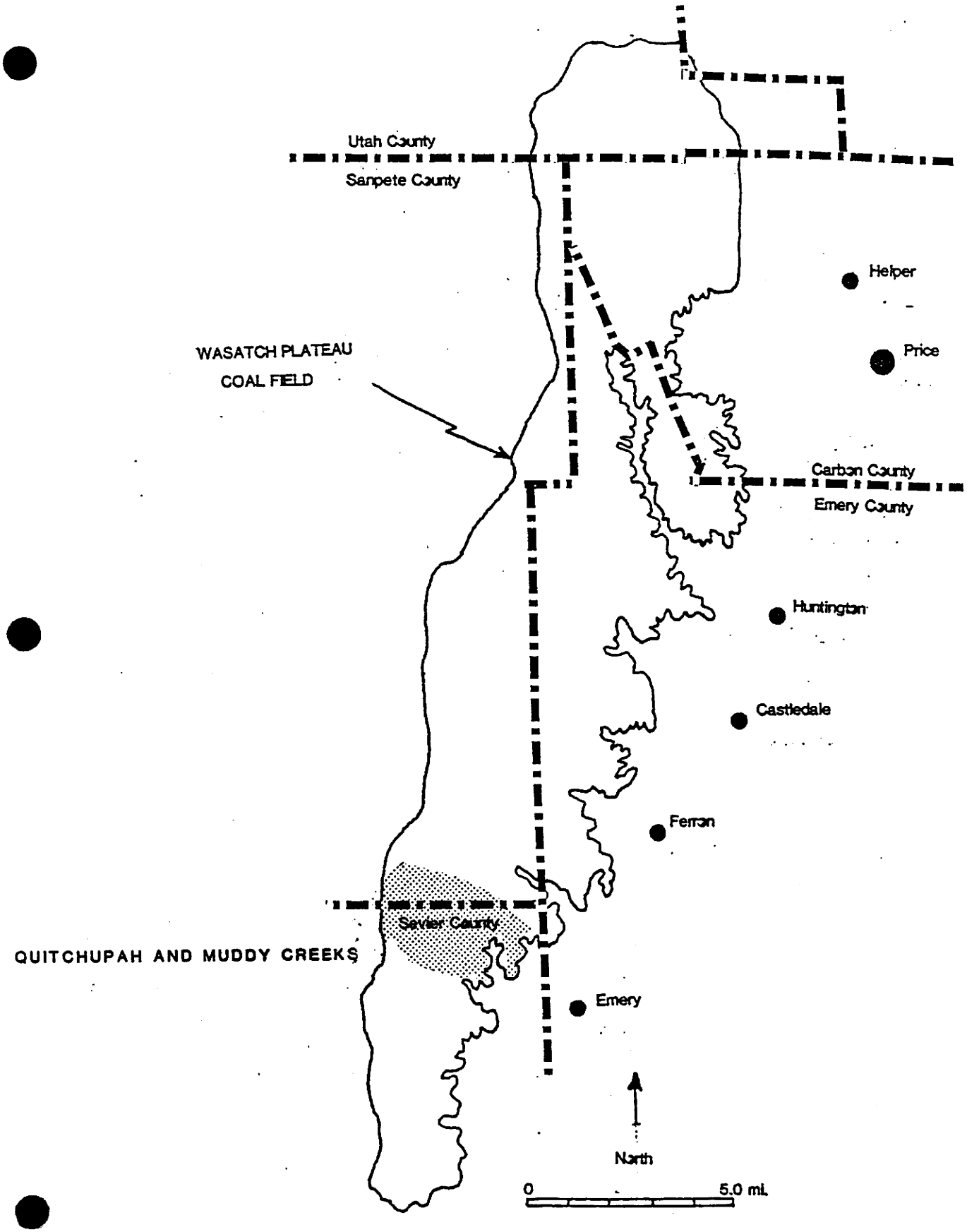

Figure 1. Wasatch Plateau Coal Field.

Pinyon-juniper woodlands occupy drier sites often with stoney to very rocky soils. Pinus edulis and Juniperus osteosperma are co-dominant in the overstory. Understory vegetation ranges from sparse to moderate ground cover on range sites in poor to excellent condition. Understory species include sagebrush, mountain mahogany (Cercocarpus montanus), serviceberry (Amelanchier utahensis), and several perennial grasses including slender wheatgrass (Agropyron trachycaulum), Salina wildrye (Elymus salina), junegrass (Koeleria cristata) and Indian ricegrass (Oryzopsis hymenoides).

Dominant shrubs of the mountain brush communities will vary depending on elevation and aspect. The drier south and west-facing slopes may support dense stands of Gambel oak (Quercus gambellii). Other dominants of this community may include serviceberry, mountain mahogany (Cercocarpus montanus) or (C. ledifolius), bitterbrush (Purshia tridentata) and greenleaf manzanita (Arctostaphylos patula).

The range of the Douglas fir-white fir-blue spruce community is about 8,000 to 10,000 feet. Douglas fir (Pseudotsuga mensiesii) is usually the dominant tree. Blue spruce (Picea pungens) is usually limited to the most mesic sites, often along streams. With dense canopies, understory vegetation may be sparse. Common shrubs include serviceberry (Amelanchier spp.), Oregon grape (Berberis repens), chokecherry (Prunus virginiana), Rocky Mountain maple (Acer glabrum), mountain lover (Pachistima myrsinites) and snowberry. Bluebunch wheatgrass (Agropyron spicatum), mountain brome (Bromus carinatus), and Kentucky bluegrass (Poa pratensis) are common grasses. Aspen stands (Populus tremuloides) can be found throughout the zone, particularly in mesic sites and as successional communities.

Engelmann spruce (Picea engelmannii) and subalpine fir (Abies lasiocarpa) dominate the spruce-fir zone at the highest elevations of the hydrologic impact area. While receiving about the same precipitation as the Douglas fir communities, lower evapo-transpiration with cooler temperatures can permit a more lush vegetation in the spruce-fir zone. Limber pine (Pinus flexilis) often occupies steep or rocky, drier sites of this zone.

Small riparian communities are found at all elevations within the impact assessment area. With greater water availability and cooler temperatures, the riparian zone often includes more mesic species (e.g., those from a higher vegetation zone). Shrub species from the mountain shrub type may be found at most elevations.

Additional riparian zone shrubs include aspen, narrowleaf cottonwood (Populus angustifolia), red osier dogwood (Cornus stolonifera), skunkbush (Rhus trilobata), river birch (Betula occidentalis) and various willows (Salix spp.). Small wet areas around springs and seeps will often support a dense growth of grasses, sedges and willows.

HYDROLOGY

The Convulsion Canyon Mine, operated by Southern Utah Fuel Company (SUFCO), is located on a tributary to Quitchupah Creek below the confluence of East Spring Canyon and Mud Spring Hollow. The permit area for the mine encompasses perennial, intermittent, and ephemeral drainage to Muddy Creek on the northern boundary of the CIA and Quitchupah Creek on the southern boundary. All flow is to the Muddy Creek drainage. Approximately 50 to 70 percent of streamflow occurs during the snowmelt runoff period. Summer precipitation does not usually produce high runoff except in localized areas. Average annual precipitation ranges from 40 inches on the mountain ridges to less than 20 inches in the valleys. Water in the headwaters of Quitchupah Creek is a calcium-bicarbonate type and is generally good quality, with mean concentrations of Total Dissolved Solids (TDS) about 260 milligrams per liter. In the lowland streams below the CIA, the dominant ions during high flow are calcium, magnesium, and bicarbonate, and during low flow, the dominant ions are sodium, calcium, and sulfate, with values of more than 2,000 mg/l Total Dissolved Solids commonly occurring. This decrease in quality is a result of natural runoff and irrigation return flows from Mancos Shale lands. The Mancos shale is easily weathered, gypsiferous, sodium- and sulfate-rich. Irrigation return flows are the primary source of salts, causing an acceleration of the natural leaching of the solutes in the soils.

Ground water is present in all lithostratigraphic units within the Wasatch Plateau Coal Field. Ground water occurs under localized conditions that often form a system of "perched" aquifers and associated springs and/or seeps. Significant localized ground-water resources are often associated with the North Horn Formation and Price River Formation. The U.S. Geological Survey has identified and formally designated the Star Point-Blackhawk aquifer as the only regional ground-water resource occurring in the Wasatch Plateau Coal Field (Danielson, et al., 1981 and Lines, 1985).

II. CUMULATIVE IMPACT AREA (CIA)

Figure 2 delineates the CIA for current and projected mining in the Quitchupah and Muddy Creek areas. The CIA encompasses approximately 77 square miles. The northern and southern CIA boundaries are designated by Muddy Creek and Quitchupah Creek, respectively. The eastern boundary is defined by the drainage divides between Wileys Fork and East Fork Box Canyon, and between Link Canyon Wash and Christiansen Wash. The western boundary is delineated by the drainage divide between Skumpah Creek and North Fork Quitchupah Creek.

III. SCOPE OF MINING

The Convulsion Canyon Mine permit area currently encompasses 7,355 acres and with the inclusion of the Quitchupah Lease Tract Addition, the total permitted area will be 17,260 acres. Leases that are designated in the Quitchupah "Logical Mining Units" are as follows: U-28297, U-062453, U-0149084, SL-062583, U-47080, and U-63214.

The Convulsion Canyon Mine commenced operation in 1941, mining federally-owned coal. The applicant currently holds six federal leases and one fee lease, of which 96 percent of the area is federally owned. Total surface disturbance for the surface facilities is approximately 68 acres.

Projected life of the mine is 50 years, with an average annual production of 2,000,000 tons per year. The majority of coal will be longwall mined from the Lower Hiawatha seam in the lease tract addition. Coal will be moved by underground conveyor from the face to the portal, then shipped by truck to Levan, Utah.

IV. STUDY AREA

GEOLOGY

The Quitchupah and Muddy Creeks CIA is characterized by cliffs, narrow canyons and high plateaus. Stratigraphic units outcropping within the area include, from oldest to youngest, Mancos Shale, Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, and Quarternary deposits. Lithographic descriptions and unit thicknesses are given in Figure 3.

Rocks in the study area strike northeast and dip approximately two degrees to the northwest. No major faults or folds occur within the CIA.

HYDROLOGIC RESOURCES

Ground Water

The ground-water regime within the CIA is dependent upon climatic and geologic parameters that establish systems of recharge, movement and discharge.

Snowmelt at higher elevations provides most of the ground-water recharge, particularly where permeable lithologies such as sandstone are exposed at the surface. Vertical migration of ground water occurs through permeable rock units and/or along zones of faulting and fracturing. Lateral migration initiates when ground water encounters impermeable rocks and continues until either the land surface is intersected (and spring discharge occurs) or other permeable lithologies or zones are encountered that allow further vertical flow.

System	Series	Formations and Members	Thickness (feet)	Lithology and Water-Bearing Characteristics
Quarternary	Holocene and Pleistocene		0-100	Alluvium and colluvium; silt, sand, gravel, and boulders; yields water to springs that may cease to flow in late summer.
Tertiary	Paleocene	North Horn Formation	1,100	Variegated shale and mudstone with interbeds of tan to gray sandstone; all of fluvial and lacustrine origin; yields water to springs.
Cretaceous	Upper Cretaceous	Price River Formation	550	Gray-to-brown, fine-to-coarse, and conglomeratic fluvial sandstone with thin beds of gray shale; yields water to springs locally.
		Castlegate Formation	150-250	Tan-to-brown fluvial sandstone and conglomerate; forms cliffs in most exposures, yields water to springs locally.
		Blackhawk Formation	850-950	Tan-to-gray discontinuous sandstone and gray carbonaceous shales with coal beds; all of marginal marine and paludal origin; locally scour-and-fill deposits of fluvial sandstone within less permeable sediments; yields water to springs and coal mines, mainly where fractured fractured or jointed.
		Star Point Sandstone	200-300	Light-gray, white, massive, and thin bedded sandstone, grading downward from a massive cliff-forming unit at the top to thin interbedded sandstone and shale at the base; all of marginal marine and marine origin; yields water to springs where fractured and jointed.
		Masuk Member Mancos Shale	600-700	Dark gray marine shale with thin, discontinued layers of gray limestone and sandstone; yields water to springs locally.

Figure 3. Stratigraphy and Hydrogeologic Characteristics of the Southern Wasatch Plateau Coal Field (after Doelling, 1972 and Danielson, et al., 1981).

The Star Point Sandstone and lower portion of the Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, and Quarternary deposits are potential reservoirs or conduits for ground water in the CIA. Reservoir lithologies are predominantly sandstone. Sandstone reservoirs occur as channel and overbank, lenticular and tabular deposits. Shale, siltstone and cemented sandstone beds act as aquacludes to impede ground-water movement. The Mancos Shale is considered a regional aquaclude that delimits downward flow within the CIA. Localized aquacludes include relatively thin, impermeable lithologies occurring within the stratigraphic section above the Star Point Sandstone.

The Star Point-Blackhawk aquifer is present and represents the only identified regional ground-water resource in the study area. Ground water associated with the Castlegate Sandstone may be characterized as occurring within a "perched" aquifer zone and represents a locally significant hydrologic resource.

Data from eight boreholes located within the proposed permit area for the Quitchupah Lease Tract Addition and Convulsion Canyon Mine permit area indicate ground water within the Star Point-Blackhawk aquifer is moving towards the southeast. An additional four boreholes located within the Convulsion Canyon Mine permit area indicate ground water within the Castlegate aquifer flows to the south. Ground-water data also show the Castlegate aquifer to have better water quality than the Star Point-Blackhawk aquifer.

Approximately 18 springs occur within the CIA (Figure 6). Total spring discharge is less than 35 gpm, giving an average spring discharge of less than 2 gpm. Spring discharge is distributed as follows:

Lithologic Unit	Number of Springs	Total Discharge
North Horn Formation	4	4.2 gpm
Price River Formation	3	4.6 gpm
Castlegate Formation	9	17.8 gpm
Blackhawk Formation	2	5.0 gpm

Analysis indicates spring water is comprised of two types representative of the north and east portions of the lease area. Spring data from Link Canyon, in the Quitchupah Creek drainage basin, indicates a neutrally aciditic sodium-bicarbonate type water. Water quality is fair to good with moderate salt concentrations. This site is representative of the eastern portion of the lease area. Spring data in the northern portion of the lease area indicates a neutrally aciditic calcium-bicarbonate type water. Water quality is considered good to excellent.

Mine inflow is approximately 650 gpm for the Convulsion Canyon Mine. Mine water is discharged to the North Fork of Quitchupah Creek and Convulsion Canyon. Analysis indicates mine discharge water to be a calcium-bicarbonate type of good quality.

Mine water within the CIA represents ground-water discharge and depletion from storage in the Blackhawk Formation and Star Point Sandstone and interception of flow along faults/fractures.

Surface Water

The CIA has been divided into two major drainage basins (Figure 5), waters draining to Muddy Creek, and waters draining to Quitchupah Creek. Although no surface disturbance is found within the Muddy Creek drainage, approximately 2.75 square miles of drainage area will fall within the mine's permit area. A major portion of this drainage area will be undermined. The surface facilities and current mine breakouts found within the Quitchupah drainage area include 23.9 square miles of potentially undermined drainage area.

Muddy Creek (1, 2 and 3)

Most of the runoff to the Muddy Creek drainage area within the CIA either comes from snowmelt in mountainous areas or baseflow recharge from ground-water. Area Two encompasses the Box Canyon drainage, which is considered a perennial drainage, due to springs issuing from the Castlegate Formation. The average gradient of Box Canyon is 50 percent. Two sampling sites (09, 089) are proposed for Box Canyon to monitor the quality and quantity of this perennial stream. A subsidence buffer zone is proposed to protect Box Canyon. Approximately 1,834 acres of permit area are found within the Box Canyon drainage. The total drainage area in Box Canyon within the CIA draining to Muddy Creek is 7,256 acres. Drainage Areas One and Three are 9,584.75 acres, and 1,071.02 acres, respectively, and drain to Muddy Creek. Neither area is undermined or within the permit area, but is contained within the CIA boundary, as potentially affected by groundwater recharge from permitted areas associated with the Quitchupah Lease Tract.

Quitchupah Creek (4, 5 and 6)

Area Four encompasses the mine site and facilities area in the Spring Canyon drainage. The average channel gradient of Spring Canyon is 6.7 percent, and the drainage contains 7,226 acres. There are five sampling sites associated with the Spring Canyon drainage. Three sampling sites are on surface water (022, 030, and 047A) and one is a spring (001) and one is a mine discharge point.

Area Five is the North Fork of Quitchupah Creek, which encompasses 15,168 acres. The average gradient of the North Fork of Quitchupah Creek is 5.9 percent. The following sampling sites (006, 007, 021 and 042) are found within Area Four. Sample site 006 is found on the South Fork of the North Fork of Quitchupah Creek. Sample Site 007 is found on the North Fork of Quitchupah Creek. Sample Site 021 is a mine water discharge point found in Section 29, T21S, R5E. Sample site 042 is found at the confluence of the North Fork of Quitchupah Creek, and the Main Fork. The channel gradient is found in the North Fork of Quitchupah Creek, and is 5.9 percent.

Area Six is the Link Canyon drainage area. There is one spring, 6W-21, in the upper reaches of Link Canyon, which will be monitored. The Link Canyon drainage is 9,972 acres and 5.1 percent gradient.

No surface facilities are found within Area Four or Five.

V. POTENTIAL IMPACTS

Ground Water

Dewatering and subsidence related to mining have the greatest potential for impacting ground-water resources in the CIA.

The Waste Rock Disposal Site for the Convulsion Canyon Mine is located in the Skumpah Creek drainage, approximately four miles east of the Quitchupah and Muddy Creeks CIA. The July 24, 1988 Cumulative Hydrologic Impact Assessment for the Waste Rock Disposal Site concluded that the proposed designs were consistent with preventing damage to the hydrologic balance outside the mine plan area.

Dewatering. The volume of water being discharged from the Convulsion Canyon Mine (690 gpm) approximates the amount of water that is currently being withdrawn from the ground-water system. The current and projected withdrawal values may be totalled and compared to estimates of ground-water discharge and recharge within the CIA, and thereby, allow an assessment of cumulative dewatering impacts.

Approximately 38,700 acres within the CIA overlie the coal resource and represent a potential recharge area (Figure 6). Average annual precipitation is approximately 20 inches over the potential recharge area and hence, the total annual precipitation over the outcropping recharge area is 67,725 acre-feet.

The total annual discharge for springs from water-bearing rock units that overlie the coal resource is 31 gpm.

Discharge also occurs directly to perennial streams where channels intersect ground water within Blackhawk Formation/Star Point Sandstone and Castlegate Sandstone. The North Fork of Quitchupah Creek, South Fork of Quitchupah Creek, Box Canyon, Greens Canyon, South Fork of Muddy Creek, and Spring Canyon are all perennial and intersect the Blackhawk Formation/Star Point Sandstone and Castlegate Sandstone within the CIA. Surface water flow data from Box Canyon, North Fork of Quitchupah Creek and South Fork of Quitchupah Creek indicate base flow recharge to a perennial stream is approximately 100 gpm. Accordingly, total base flow recharge to streams within the CIA is estimated to be 600 gpm.

No additional ventilation fans are planned for the Convulsion Canyon Mine. At the current ventilation rate of 575,000 cfm, the approximate discharge rate is 38 gpm; i.e., the amount of ground water discharged to the atmosphere by mine ventilation systems. Psychrometric formulas were utilized to derive ventilation discharge values and extrapolated to the mine elevations - average relative humidity data from the Central Weather Station in the Manti-LaSal National Forest were also used in the psychrometric calculations.

Total ground-water discharge within the CIA is currently about 1,320 gpm, where 48 percent (630 gpm) of the total represents natural discharge to streams and springs and 52 percent (690 gpm) results from mining activities.

Lines (1985) investigated the Trail Mountain area, located approximately 30 miles northeast of the CIA, and indicated regional aquifer inflow to mines is derived from aquifer storage (80 percent) and aquifer discharge (20 percent). Extrapolating these values to the Quitchupah and Muddy Creeks CIA allows depletion due to present mining activities (4,775 acres mined) of regional aquifer storage and discharge to be estimated at 550 gpm and 140 gpm, respectively. Assuming future mining encompasses 7,062 acres and will continue to encounter steady-state inflow from the regional aquifer, then depletion would increase by 820 gpm for storage and 200 gpm for discharge.

Future mining-induced dewatering is projected to encompass 1020 gpm, and hence, the cumulative dewatering total would be approximately 1,700 gpm. Following the cessation of mining, the discharge of ground water to the North Fork of Quitchupah Creek, Convulsion Canyon and the atmosphere will cease and workings will begin to flood.

The impact associated with the reduction in surface flow is considered temporary. Mine flooding will conceivably recharge regional aquifer storage and re-establish the natural ground-water conduit system that was operational prior to mining. The maximum time span required for complete mine flooding may be derived by assuming that the area of final workings (11,800 acres) will remain open (average five-foot height) and caving will not occur.

Accordingly, for workings that experience inflow, an upper limit of 20 years may be derived for complete mine flooding. It should be noted that complete flooding will, undoubtedly, never be achieved because the hydraulic head generated as flooding proceeds will increase until the hydraulic properties of the roof, floor, and rib are exceeded and flow within the rocks initiates.

Subsidence. Subsidence impacts are largely related to extension and expansion of the existing fracture system and upward propagation of new fractures. Inasmuch as vertical and lateral migration of water appears to be partially controlled by fracture conduits, readjustment or realignment in the conduit system will inevitably produce changes in the configuration of ground-water flow. Potential changes include increased flow rates along fractures that have "opened", and diverting flow along new fractures or within permeable lithologies. Subsurface flow diversion may cause the depletion of water in certain localized aquifers such as the Castlegate aquifer. Increased flow rates along fractures would reduce ground-water residence time and potentially improve water quality.

Mining has not occurred and will not occur beneath any springs within the CIA. Accordingly, diversion of spring flow is considered to be at an overall very low risk.

Surface Water

No surface disturbance will occur in the Quitchupah Lease Tract Addition permit area. Therefore, any impacts to the surface water regime will be associated with the underground mining activities and/or existing surface facilities at the Convulsion Canyon Mine.

Approximately four miles downstream of the mine facilities, surface flow originating from the mine lease area crosses the Mancos Shale formation. At this point, water quality rapidly deteriorates to poor conditions resulting from lithologic influences. Therefore, any impacts to surface water quality will likely be limited to localized regional effects.

All existing surface facilities associated with the mining operations are required to maintain sediment treatment facilities. Mine water is also treated for suspended sediments before being discharged. Therefore, potential impacts to the surface water system from additional sediment contributions are not anticipated.

Surface water runoff from the main mine facilities in Spring Canyon is diverted to a sedimentation pond prior to being discharged into East Spring Creek. Water quality monitoring records show that this structure has seldom discharged during the life of the operation. Discharge has occurred only during major storm events when the receiving stream is flowing at relatively high levels or

during controlled decanting of the pond. Samples collected during discharge events indicate treated water quality to be fair to good. Constituent concentrations of the discharged water are generally less than the receiving water.

Ground-water inflow to the mine workings is collected and diverted to an underground sump for treatment. Mine water is then discharged from an access portal into the North Fork of Quitchupah Creek. Data collected upstream of the discharge point and at the mine portal were analyzed using mass balance techniques. Results presented in Table 1 show that some localized water quality degradation occurs from mine discharge into the stream system. However, water quality downstream of the mine discharge point remains good with respect to TDS values and regional water quality in the area.

	TDS	Sulfate	Sodium	Magnesium	cfs
above portal (calculated)	378.1	79.2	35.0	29.1	3.14
mine discharge	578.2	222.8	48.0	45.5	1.58
below portal (calculated)	445.1	127.3	39.4	34.6	4.72

Table 1. Mass Balance Analysis of Mine Water Discharge to Surface Waters.

VI. SUMMARY

It has been established using all existing data from current mining operations that future development of the Quitchupah Lease Tract Addition permit area will have no significant impact to the regional surface water system.

All existing surface facilities at the SUFCO mine site are required to maintain sediment treatment facilities. All sediment control measures have been designed and implemented to prevent contamination of surface water. Therefore, potential impacts to the surface water system from additional sediment contributions are not anticipated.

Mine operations within the CIA currently intercept regional aquifer flow at an approximate rate of 690 gpm. Of this total, approximately 40 gpm are consumptively lost to mine ventilation. The remaining 650 gpm are discharged without interbasin transfer of water to streams. Mine water discharge meets required effluent limitations.

During future mining operations, inflow from the regional aquifer is estimated to increase from 960 gpm to 1,700 gpm. Approximately 80 percent of the flow will be derived from storage and 20 percent from discharge. Consumptive use is not anticipated to increase. Mine water discharge (1,660 gpm) and ventilation losses (40 gpm) will be discontinued upon cessation of mining. Concommitantly, flooding of abandoned workings will initiate. An upper limit of 20 years has been estimated for complete flooding of workings and reestablishment of the premining ground-water system.

Diversion of spring flow is considered to be at overall very low risk.

The designs proposed for all anticipated mining operations within the CIA are herein determined to be consistent with preventing damage to the hydrologic balance outside the proposed mine plan areas.

VII. REFERENCES

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Doelling, H.H., 1972, Central Utah Coal Fields: Sevier, Sanpete, Wasatch Plateau, Book Cliffs and Emery; Utah Geological and Mineral Survey, Monograph Ser. No. 3.

Lines, G., 1985. The Ground-Water System and Possible Effects of Underground Coal Mining in the Trail Mountain Area. Central Utah: U.S. Geological Survey, Open-File Report 84-067.

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LETTERS

OF

CONCURRENCE

Norman H. Bangerter
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Dale C. Hatch, C.P.A.,J.D.
Director
Michael E. Christensen, Ph.D.
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September 13, 1989

Mr. Richard Smith
Division of Oil, Gas and Mining
3 Triad Center, Suite 350
355 West North Temple
Salt Lake City, Utah 84180-1203

SUBJECT: Quitchupah Coal Lease Tract Addition - Convulsion Canyon Mine
State Application Identifier #UT890901-020

Dear Richard:

The Resource Development Coordinating Committee of the State of Utah has reviewed this proposed action, and has no comments at this time.

The Committee appreciates the opportunity to review this proposal. Please direct any other written questions regarding this correspondence to the Utah State Clearinghouse, at the above address, or call Carolyn Wright at (801) 538-1535, or John Harja at (801) 538-1559.

Sincerely,

Michael E. Christensen

Michael E. Christensen
State Planning Coordinator

MEC/cw

Norman H. Bangerter
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August 31, 1989

TO: Susan C. Linner

FROM: Joseph C. Helfrich

RE: Compliance Review for Section 510(c) Finding, Coastal States Energy Company (Southern Utah Fuel Company), Convulsion Canyon Mine, ACT/041/002, Sevier County, Utah

As of the writing of this letter, there are no NOV's or CO's which are not corrected or in the process of being corrected. Any NOV's or CO's that are outstanding are in the process of administrative or judicial review. There are no finalized Civil Penalties which are outstanding and overdue in the name of Coastal States Energy Company (Southern Utah Fuel Company).

Finally, they do not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

jb
MN47/49